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April 2, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *PCT Gazette* at No. 24/1984 page 3095 on Oct. 25, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for the first 10 national or regional offices)	64.00
Designation fee for 11th and subsequent designations	no charge

Feb. 4, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Mar. 30, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,321,708 through 4,322,857

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Board of Appeals Decisions Rendered in the Month of Feb. 1985

Affirmed	164
Affirmed in part	35
Reversed	71
Total	270

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,289,880, Re. S.N. 701,047, Filed Feb. 12, 1985, Cl. 544/103, CATIONIC OXAZINE DYES, Peter Moser, Owner of Record: *Ciba-Geigy Corp., Ardsley, N.Y.,* Attorney or Agent: Karl F. Jorda, et al., Ex. Gp.: 129

4,373,793, Re. S.N. 701,780, Filed Feb. 13, 1985, Cl. 354/415, LIGHT MEASURING DEVICE FOR FLASH PHOTOGRAPHY, Nobuyuki Taniguchi, et al., Owner of Record: *Minolta Camera Kabushiki Kaisha, Osaka, Japan,* Attorney or Agent: Harold L. Jackson, et al., Ex. Gp.: 211

4,402,517, Re. S.N. 622,958, Filed June 21, 1984, Cl. 277/34, WELL PACKER VALVE ARRANGEMENT, Edward T. Wood, et al., Owner of Record: *Completion Tool Co., Houston, Tex.,* Attorney or Agent: Donald H. Fidler, Ex. Gp.: 246

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,743,581, Reexam. No. 90/000,724, Requested: Feb. 15, 1985, Cl. 435/34, MICROBIOLOGICAL DETECTION APPARATUS, Paxton Cady, et al., Owner of Record: *Bactomatic, Inc., Palo Alto, Calif.,* Attorney or Agent: Leonard Phillips, Ex. Gp.: 128, Requester: Malthus Instruments, Washington, D.C.

4,076,698, Reexam. No. 90/000,729, Requested: Feb. 26, 1985, Cl. 526/34.6, HYDROCARBON INTERPOLYMERS COMPOSITIONS, Arthur W. Anderson, et al., Owner of Record: *E.I. DuPont de Nemours & Co., Wilmington, Del.,* Attorney or Agent: Roger Hines, Ex. Gp.: 150, Requester: Phillips Petroleum Co., Bartlesville, Okla.

4,180,536, Reexam. No. 90/000,731, Requested: Feb. 25, 1985, Cl. 525/214, PROCESSIBLE AND VULCANIZABLE POLAR POLYMERS, Dominic Alia, Owner of Record: *Dominic Alia, Williamsport, Pa.,* Attorney or Agent: Sughrue, Mion, et al., Ex. Gp.: 150, Requester: Dow Chemical Co., Midland, Mich.

4,309,962, Reexam. No. 90/000,733, Requested: Mar. 5, 1985, Cl. 119/73, LIVESTOCK WATERING STATION, John D. Boozer, Owner of Record: *John D. Boozer, Ocala, Fla.,* Attorney or Agent: R. J. Lasker, Ex. Gp.: 330, Requester: Clear Waterers, Inc., Churchville, Md.

4,349,601, Reexam. No. 90/000,732, Requested: Mar. 1, 1985, Cl. 428/323, PROTECTIVE SKIN ON INTRICATELY MOLDED PRODUCT, Walter H. Brueggemann, et al., Owner of Record: *Ferro Corp., Cleveland, Ohio,* Attorney or Agent: Milton L. Simmons, Ex. Gp.: 154, Requester: Naamloze Vennootschap DSM & Stamicarbon B.V., Washington, D.C.

Marks Published for Opposition

The Apr. issues of the Official Gazette (Trademark Section) will present marks published for opposition in two separate sections.

Each section will contain both multiple class and single class applications. The first section will be printed at the beginning of the Official Gazette and the second section will be printed at the end of the Official Gazette, after the Index of Registrants.

The second section will be numbered separately from the first section, and each page will bear the notation Ap.

Jan. 10, 1985.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

U.S. GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-236,084 (4,477,384). PREPARATION OF A-SUBSTITUTED ACRYLIC ACIDS.

SN 6-311,702 (4,479,286). APPARATUS TO EXTRACT FINE TRASH AND DUST DURING HIGH-VELOCITY DISCHARGING OF COTTON FROM OPENER CLEANER.

SN 6-327,296 (4,480,040). SENSITIVE AND RAPID DIAGNOSIS OF VIROID DISEASES AND VIRUSES.

SN 6-333,945 (4,478,328). AUTOMATIC HIDE PROCESSING APPARATUS.

SN 6-370,020 (4,482,728). POLYBUTYLBENZYLPHENOLS AND BENZYL-3,4-METHYLENEDIOXBENZENES IN INSECT POPULATION CONTROL.

SN 6-382,903 (4,478,859). METHOD OF MAKING STABLE EMULSIFIED MEAT PRODUCTS.

SN 6-436,542 (4,477,389). POLYHALOGENATED PHENYL ISOCYANATE SYNTHESIS WITH EXCESS PHOSGENE AND EITHER TRIETHYLAMINE OR TETRAMETHYLUREA.

SN 6-509,091 (4,478,096). SHIELDED SNIFFING DEVICE.

SN 6-543,730 (4,478,728). PROCESS AND COMPOSITIONS FOR PRESERVING FRESH HIDES AND SKINS.

SN 6-650,737. METHOD AND APPARATUS TO CONTROL SOIL MOISTURE MATRIC POTENTIAL.

DEPARTMENT OF COMMERCE

SN 6-665,875. SHALE OIL DEARSENATION PROCESS.

SN 6-666,594. PHASED ANTENNA ARRAY FOR WIND PROFILING APPLICATIONS.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-396,055 (4,476,870). FIBER OPTIC PO_2 PROBE.

SN 6-571,911. DEOXYRIBONUCLEIC ACID MOLECULES USEFUL AS PROBES FOR DETECTING

DELETERIOUS GENES INCORPORATED INTO CHROMOSOMAL DNA.
SN 6-574,173. PSEUDOMONAS EXOTOXIN CONJUGATE IMMUNOTOXINS.
SN 6-664,972. PRODUCTION OF HUMAN T-CELL LEUKEMIA (LYMPHOTROPIC) RETROVIRUS (HTLV-I) ENVELOPE PROTEIN FRAGMENTS IN BACTERIA AND USE IN SEROEPIDEMIOLOGICAL SURVEY OF HUMAN LYMPHOID MALIGNANCIES.
SN 6-665,400. SCREENING TEST FOR REVERSE TRANSCRIPTASE CONTAINING VIRUS.

DEPARTMENT OF THE AIR FORCE

SN 6-171,913 (4,468,624). PROGRAMMABLE SYNCHRONOUS DIGITAL DELAY LINE.
SN 6-260,878 (4,472,726). TWO CARRIER DUAL INJECTOR APPARATUS.
SN 6-272,861 (4,465,392). THERMALLY ISOLATED STRUCTURAL SUPPORT LINK.
SN 6-289,660 (4,472,807). RF LASER ARRAY DRIVER APPARATUS.
SN 6-320,893 (4,466,662). POWERED ARTICULATED HEADREST SYSTEM.
SN 6-324,907 (4,472,679). DIAGNOSTIC APPARATUS FOR RADAR PULSE REPETITION FREQUENCY CONTROL CIRCUIT CARD.
SN 6-339,204 (4,467,429). AIRCRAFT THRUST CONTROL SCHEME FOR TERRAIN FOLLOWING SYSTEM.
SN 6-343,041 (4,467,186). MIRROR ACTUATOR CONTROL SYSTEM.
SN 6-343,136 (4,472,356). GAS CONTAMINATION DETECTION DEVICE.
SN 6-353,981 (4,477,909). UNSTABLE OPTICAL RESONATOR WITH CANCELLING EDGE WAVES.
SN 6-353,983 (4,465,985). HARDWIRE MISSILE RECEIVER COUPLER.
SN 6-368,787 (4,465,940). ELECTRO-OPTICAL TARGET DETECTION.
SN 6-372,364 (4,479,222). DIFFUSION BARRIER FOR LONG WAVELENGTH LASER DIODES.
SN 6-375,622 (4,465,332). HOLOGRAPHIC DIRECTIONAL COUPLER FOR FIBER OPTIC SYSTEMS.
SN 6-382,068 (4,477,152). REDUCTION OF SIGNAL MODULATION CAUSED BY POLARIZATION IN VISIBLE OPTICAL SCANNING SYSTEMS.
SN 6-382,324 (4,466,100). DELTA WING NOZZLE ASSEMBLY FOR CHEMICAL LASERS.
SN 6-394,945 (4,465,068). METALLIC AID AND TECHNIQUE IN FITTING VOICE PROSTHESIS.
SN 6-403,214 (4,469,961). FAST SWITCHING DRIVER FOR INDUCTIVE LOAD, SUCH AS A PHASE SHIFTER.
SN 6-404,096 (4,477,814). DUAL MODE RADIO FREQUENCY-INFRARED FREQUENCY SYSTEM.
SN 6-411,946 (4,471,683). VOICE COMMAND WEAPONS LAUNCHING SYSTEM.
SN 6-413,297 (4,476,806). WET FILM APPLICATOR.
SN 6-418,867 (4,465,953). RIPPLED-FIELD MAGNETRON APPARATUS.
SN 6-422,429 (4,465,372). TURBULENCE MEASUREMENT INTERFEROMETER APPARATUS.
SN 6-431,435 (4,477,222). MOUNTING CONSTRUCTION FOR TURBINE VANE ASSEMBLY.
SN 6-434,647 (4,471,623). COMBUSTION CHAMBER FLOATWALL PANEL ATTACHMENT ARRANGEMENT.
SN 6-441,814 (4,465,347). HELMET MOUNTED TELESCOPE.
SN 6-441,816 (4,465,988). SLOW WAVE CIRCUIT WITH SHAPED DIELECTRIC SUBSTRATE.
SN 6-449,922 (4,477,043). BIODYNAMIC RESISTANT CONTROL STICK.
SN 6-459,159 (4,477,787). DUAL MODE DIRECTIONALLY COUPLED BAND REJECT FILTER APPARATUS.
SN 6-465,230 (4,465,250). WINDBLAST LEG PROTECTOR ASSEMBLY.
SN 6-469,369 (4,476,710). DETONATION TRANSFER EVALUATION TECHNIQUE.
SN 6-475,665 (4,464,972). LATERAL SUPPORT SYSTEM FOR CANISTER-LAUNCHED MISSILE.
SN 6-482,375 (4,477,024). CARBON/CARBON ROCKET MOTOR EXIT CONE REINFORCEMENT.
SN 6-482,754 (4,476,718). RAIN RATE METER.
SN 6-486,598 (4,465,253). FLEXIBLE LINE SUPPORT ASSEMBLY.
SN 6-504,183 (4,464,702). EMI FILTER CAPACITOR UNIT.
SN 6-518,590 (4,476,161). METHOD OF PRODUCING A BURIED LONG PERIOD GRATING.
SN 6-533,276 (4,467,474). HALOGEN MASS FLOW RATE DETECTION SYSTEM.
SN 6-534,030 (4,476,337). METHOD FOR INTRODUCING FLUORINE INTO AN AROMATIC RING.
SN 6-629,865. BATTERY CONTROL AND FAULT DETECTION METHOD.
SN 6-640,624. MATRIX DISPLAY SIMULATION.
SN 6-640,902. TRACKING SERVO COMPENSATOR WITH RATE AIDING.
SN 6-640,904. PARALLEL PROCESSOR CONFIGURATION FOR ADAPTIVE ANTENNA ARRAYS.
SN 6-640,916. METHOD FOR MAKING ALLOY ADDITIONS TO BASE METALS HAVING HIGHER MELTING POINTS.
SN 6-643,139. BURIED JUNCTION ENHANCED SCHOTTKY BARRIER DEVICE.
SN 6-643,140. EROSION-RESISTANT NOSETIP CONSTRUCTION.
SN 6-645,389. CRYOGENIC GLASS-TO-METAL SEAL.
SN 6-645,390. RANDOM PATTERN TRACKING ACCELERATION TOLERANCE TESTER.
SN 6-645,468. LOW NOISE MULTIPLE CRYSTAL-CONTROLLED OSCILLATOR.
SN 6-647,781. ELECTROMECHANICAL SWITCH.
SN 6-647,782. DYNAMIC POLYMER PRESSURE TRANSDUCER WITH TEMPERATURE COMPENSATION.
SN 6-649,565. BOMB AND BOMB LINER.

DEPARTMENT OF THE ARMY

SN 6-248,622 (4,434,168). NARCOTIC ANTAGONISTS IN THE THERAPY OF SHOCK.
SN 6-284,279 (4,368,194). PHARMACOLOGICALLY ACTIVE AMINE BORANES.
SN 6-328,638 (4,431,807) 4-METHYL-5-(UNSUBSTITUTED AND SUBSTITUTED PHENOXY)-6-(AMINOALKYLAMINO)QUINOLINES.
SN 6-546,076 (4,473,496). INTRAMOLECULARLY CROSSLINKED HEMOGLOBIN.
SN 6-637,250. VEHICLE-TO-VEHICLE CONNECTION MECHANISM.
SN 6-647,324. TORQUE SENSOR.
SN 6-653,116. HIGH CAPACITY INORGANIC OXYHALIDE ELECTROCHEMICAL CELL.
SN 6-655,114. RECHARGEABLE LITHIUM CELL.
SN 6-664,267. MICROWAVE RESONATOR USING LATERAL EXCITATION.

DEPARTMENT OF THE INTERIOR

SN 6-574,499. FORMATION OF TUNGSTEN MONOCARBIDE FROM A MOLTEN TUNGSTATE HALIDE PHASE BY GAS SPARGING.

ENVIRONMENTAL PROTECTION AGENCY

SN 6-518,172 (4,479,877). REMOVAL OF NITRATE FROM WATER SUPPLIES USING A TRIBUTYL

AMINE STRONG BANSE ANION EXCHANGE RESIN.

Errata

"All reference to Patent No. D. 277,271 to Denny B. Law of Calif. for 'TRAILER' appearing in the Official Gazette of Jan. 22, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,483,542 to Joseph H. Hynes, et al. of Tex. for 'ANNULAR PACKING UNIT AND INSERT' appearing in the Official Gazette of Nov. 20, 1984, should be deleted since no patent was granted."

"All reference to Patent No. 4,488,095 to Thomas E. Berg, et al. of Colo. for 'TWO AXIS LINEAR MOTOR FOR OPTICAL FOCUSING AND TRACKING SYSTEM IN OPTICAL RECORDING' appearing in the Official Gazette of Dec. 11, 1984, should be deleted since no patent was granted."

"All reference to Patent No. 4,488,225 to Shunsuke Furukawa, et al. of Japan for 'DATA TRANSFER APPARATUS FOR A MICROCOMPUTER SYSTEM' appearing in the Official Gazette of Dec. 11, 1984, should be deleted since no patent was granted."

"All reference to Patent No. 4,495,406 to Yoshio Saka i, et al. of Japan for 'HEATING SHEET' appearing in the Official Gazette of Jan. 22, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,497,680 to Edmond A. Richards of N.J. for 'APPARATUS FOR CONVEYING A SEMICONDUCTOR WAFER' appearing in the Official Gazette of Feb. 5, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,499,411 to Donald L. Hornback of Mich. for 'AUTOMATIC ANTENNA POSITIONING SYSTEM' appearing in the Official Gazette of Feb. 12, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,501,395 to Marold H. Lohrenz, et al. of Okla. for 'TAPE DECK HAVING IMPROVED TAPE PATH' appearing in the Official Gazette of Feb. 26, 1985, should be deleted since no patent was granted."

"All reference to Patent No. 4,501,789 to Pravinchandra K. Shah, et al. of Ohio for 'LATEX CONTAINING ODOR INHIBITOR' appearing in the Official Gazette of Feb. 26, 1985, should be deleted since no patent was granted."

Restriction Practice Survey II

This notice is intended to inform the public of the results of a follow-up survey of applications containing a written restriction requirement. The results of the first survey were reported in the Official Gazette on Sept. 4, 1984 (1046 OG 2; Restriction Policy and Practice). Survey II involved 319 applications selected at random in the Patent Examining Groups from those in which a restriction only action had been credited to an examiner in the period of July—Sept. 1984. This period was after the Corps Management Meeting on June 5, 1984 in which restriction policy and practice were reviewed with all SPEs and Directors, and followed the distribution of review materials to all examiners. The results of Survey II showed significant improvements over the results of Survey I, but the results were still not considered satisfactory in several aspects.

Survey Procedure: The selection of applications was generally proportioned among the Groups to correspond to the relative proportion of restriction only actions that were completed in each Group in the last quarter of FY 84. A minimum of ten applications were surveyed from each Group. The distribution was as follows:

110 - 16	210 - 11	310 - 10
120 - 37	220 - 10	320 - 18
130 - 33	230 - 10	330 - 24
150 - 47	240 - 30	340 - 30
	250 - 13	350 - 20
	260 - 10	
TOTALS 133	84	102

The survey team consisted of the same people who conducted the first survey. One person from the survey team reviewed each selected application file and completed the survey form regarding the restriction requirement(s) in the file. The same survey form was used in each survey.

In the event an application file could not be located or was not readily available, a different application was selected for the survey. In general, the substitute application was selected from those requirements completed by the same examiner assigned to the original application.

The survey did not include any design applications.

Survey Results: Statistical results of the survey are set forth on the survey form used in the Appendix including summaries on a Corps and discipline level. References in this notice to "Item ——" refer to the numbered items indicated on the survey form. These results indicate an improvement in all areas which were identified as acute problems in the first survey. We did not do a telephone survey to determine whether applicant's representative had been called prior to writing the requirement.

In addition to the survey, the statistics on restriction requirements before and after the training effort following the first survey are of interest. Statistics show that the number of restriction only actions has decreased 36% Corps-wide (52% in Group 120 which had the highest volume in the first survey) following our training effort. These statistics are shown below.

Quarter	Total First Actions	Total Corps Restriction Requirements	Group 120 Restriction Requirements
Apr–Jun 1984	32,035	2,771	514
Jul–Sep 1984	32,216	1,939	220
Oct–Dec 1984	28,158	1,522	212
	(32,358)*	(1,775)*	(247)*
Oct–Dec vs Apr–Jun		−36%	−52%.

*Figures adjusted (7/6 of actual) to reflect a 7 pay period quarter for comparison with the Apr.–June and July–Sept. quarters which included 7 pay periods.

In addition, 24% of the applications in the second survey contained a specific reference to a telephone call that was made by the examiner, but did not result in an election being made. It was also apparent that some of the requirements were sufficiently complex to warrant a written communication.

The applications reviewed in the second survey resulted in the conclusion that 9% of the requirements that were made were not reasonable on the record that was reviewed (Item 10 - 30/319). This compares to 19% (61/320) in the first survey. Of the 30 cases in which a conclusion of unreasonableness was made, the requirement was traversed in 22 (73%) of those cases, not traversed in 7 cases (23%), and no response was filed in 1 case. In the 22 cases where the unreasonable requirement was traversed, the requirement was withdrawn in 10 cases, not withdrawn in 8 cases, and no subsequent action had been made in 4 cases. In the first survey, 11 unreasonable requirements were withdrawn out of 61 made. The survey form on each of the unreasonable requirements in the second survey was returned and discussed with the Group Director.

In our opinion, the reasons provided by the examiner for insisting upon restriction were not proper (either non-existent or based on the wrong criteria) in 18%

(Item 5j - 57/319) of the applications surveyed — compared to 35% in the first survey. In many of these cases, the reviewer determined that the requirement was justified, but for reasons which the examiner did not set forth in the requirement.

Our second survey revealed that applicant had traversed the requirements in 134 cases (Item 7c), and that where the examiner had given another action in those cases (Item 8 - 98), the reasons in the traverse had not been responded to in 30% (Item 8b - 30/98) of the cases. This represents a very modest improvement of the results in the first survey where 41% (53/128) had not responded to the arguments presented in applicants traverse.

In addition to the statistical results, the survey team met to discuss some of the problems observed during the survey. Several members of the team again observed that problems were more likely to arise where complex requirements involving a large number of claims and/or inventions are encountered, and where the claim schedule required the application of combination—subcombination criteria to show patentable distinctness (MPEP 806.05c - two-way distinctness). Where three or more inventions are presented in a single application, it was observed that the examiner rarely showed distinctness among all of the combinations of groups (e.g. I–II, II–III, I–III). Another observation that was frequently made was that many of the problems with incomplete requirements could have been avoided by the use of the form paragraphs and associated instructions.

Further Action: While the second survey indicated that significant improvements have been realized in our pursuit of uniformity in restriction practice, we have not achieved an acceptable level of performance in several areas. The same types of problems predominated in each survey, but are now at a reduced level. There is clearly a continuing need for supervisory review.

Supervisors will take the opportunity to emphasize the following points to examiners in their Art Units:

(1) Use of telephone when appropriate to minimize pendency time;
(2) Reasons to support the requirement (to satisfy the criteria for independence of patentable distinctness) *and* reasons for insisting upon restriction should be given in each written requirement. Mere conclusions are not sufficient;
(3) The substance of arguments contained in applicant's traverse should be responded to in the Office action following the traverse;
(4) A showing of two-way distinctness is required in situations where combination-subcombination criteria are applicable (MPEP 806.05c); and
(5) Use of appropriate form paragraphs should be encouraged.

In addition, each Group will review all restriction requirements made in the Group in a pay period at least once every six months.

Finally, review of restriction practice will not be made a component part of the Quality Review Program on an ongoing basis because of the desirability of identifying problems of this type before prosecution is over and the desirability of maintaining their focus on substantive issues. Of course, the Quality Review Staff will continue to bring problems with restriction requirements to the attention of the Director when they are encountered in the course of their review procedures.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Restriction Practice Survey—Feb. 1985 **CORPS**

Serial No._____ Art Unit_____ Reviewer_____

Indicate type of Restriction or other requirement by checking box(s). Explain any deficiencies in Comments (Item 11).

	1.	Telephone	76 Yes	193 No	
77	2.	Generic Claim, Election of Species			
15	2a.	Markush-Type, Plurality of Patentably Distinct Inventions			
22	3.	No Generic Claim Present, Election of Species			
	4a.	Were the inventions properly grouped?	262 Yes	36 No	
	4b.	Were linking claims properly identified and grouped?	48 Yes	17 No	232 N/A
	5.	Reasons for Separate and Distinct Inventions			
	16	a. Intermediate- Final Product			
	37	b. Combination- Subcombination			
	21	c. Subcombination, Useable Together			
	60	d. Process and Apparatus			
	81	e. Product and Process of Making			
	5	f. Apparatus and Product Made			
	31	g. Product and Process of Using			
	2	h. Product, Process of Using and Process of Making			
		i. Conclusion to all Restriction Requirements proper?	286 Yes	19 No	
		j. Were Examiner's reasons reasonable?	260 Yes	57 No	
	6.	Requirement, When Mailed			
	A.	Was election required?	305 Yes	13 No	
	B.	30 day period set?	303 Yes	15 No	
		If other than 30 day period indicate_____			
	7A.	Was there a response to the requirement?	301 Yes	17 No	
	B.	Was an election made?	297 Yes	3 No	
	C.	Was requirement traversed?	134 Yes	160 No	
	D.	Was traversal based on allegation that:			
	2	1. PTO policy is wrong			
	99	2. Examiner reasoning is wrong			
	52	3. No burden on examiner			
	9	4. Other_____			
	8.	Further action by Examiner			
	A.	Did Examiner rebut applicant's traversal?	68 Yes	30 No	140 N/A
	B.	Did Examiner Make requirement final?	60 Yes	39 No	139 N/A
	C.	Modified?	15 Yes	78 No	
	D.	Withdrawn?	15 Yes	73 No	
	9.	Other			
	10.	Based on the record is the restriction requirement prima facie reasonable?	289 Yes	30 No	(10)*
	11.	Comments:			

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*( ) withdrawn

Restriction Practice Survey—Feb. 1985 **CHEMICAL**

Serial No._____ Art Unit_____ Reviewer_____

Indicate type of Restriction or other requirement by checking box(s). Explain any deficiencies in Comments (Item 11).

	1.	Telephone	38 Yes	44 No	
12	2.	Generic Claim, Election of Species			
15	2a.	Markush-Type, Plurality of Patentably Distinct Inventions			
5	3.	No Generic Claim Present, Election of Species			
	4a.	Were the inventions properly grouped?	112 Yes	14 No	
	4b.	Were linking claims properly identified and grouped?	7 Yes	5 No	114 N/A
	5.	Reasons for Separate and Distinct Inventions			
	15	a. Intermediate- Final Product			
	6	b. Combination- Subcombination			
	2	c. Subcombination, Useable Together			
	36	d. Process and Apparatus			
	35	e. Product and Process of Making			
	1	f. Apparatus and Product Made			
	27	g. Product and Process of Using			
	1	h. Product, Process of Using and Process of Making			
		i. Conclusion to all Restriction Requirements proper?	119 Yes	14 No	
		j. Were Examiner's reasons reasonable?	112 Yes	21 No	
	6.	Requirement, When Mailed			
	A.	Was election required?	127 Yes	6 No	
	B.	30 day period set?	128 Yes	5 No	
		If other than 30 day period indicate_____			
	7A.	Was there a response to the requirement?	128 Yes	4 No	
	B.	Was an election made?	126 Yes	2 No	
	C.	Was requirement traversed?	69 Yes	59 No	
	D.	Was traversal based on allegation that:			
	2	1. PTO policy is wrong			
	51	2. Examiner reasoning is wrong			
	24	3. No burden on examiner			
	3	4. Other_____			
	8.	Further action by Examiner			
	A.	Did Examiner rebut applicant's traversal?	39 Yes	9 No	52 N/A
	B.	Did Examiner Make requirement final?	37 Yes	14 No	44 N/A
	C.	Modified?	8 Yes	34 No	
	D.	Withdrawn?	2 Yes	39 No	
	9.	Other			
	10.	Based on the record is the restriction requirement prima facie reasonable?	121 Yes	12 No	(2)*
	11.	Comments:			

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*( )withdrawn

Restriction Practice Survey—Feb. 1985 **ELECTRICAL**

Serial No._____ Art Unit_____ Reviewer_____

Indicate type of Restriction or other requirement by checking box(s). Explain any deficiencies in Comments (Item 11).

	1.	Telephone	17 Yes	67 No	
22	2.	Generic Claim, Election of Species			
–	2a.	Markush-Type, Plurality of Patentably Distinct Inventions			
5	3.	No Generic Claim Present, Election of Species			
	4a.	Were the inventions properly grouped?	68 Yes	12 No	
	4b.	Were linking claims properly identified and grouped?	5 Yes	6 No	72 N/A
	5.	Reasons for Separate and Distinct Inventions			
		1 a. Intermediate- Final Product			
		12 b. Combination- Subcombination			
		9 c. Subcombination, Useable Together			
		9 d. Process and Apparatus			
		28 e. Product and Process of Making			
		2 f. Apparatus and Product Made			
		4 g. Product and Process of Using			
		1 h. Product, Process of Using and Process of Making			
		i. Conclusion to all Restriction Requirements proper?	79 Yes	5 No	
		j. Were Examiner's reasons reasonable?	62 Yes	22 No	
	6.	Requirement, When Mailed			
	A.	Was election required?	82 Yes	1 No	
	B.	30 day period set?	80 Yes	3 No	
		If other than 30 day period indicate_____			
	7A.	Was there a response to the requirement?	75 Yes	9 No	
	B.	Was an election made?	73 Yes	1 No	
	C.	Was requirement traversed?	26 Yes	43 No	
	D.	Was traversal based on allegation that:			
		– 1. PTO policy is wrong			
		22 2. Examiner reasoning is wrong			
		11 3. No burden on examiner			
		4 4. Other_____			
	8.	Further action by Examiner			
	A.	Did Examiner rebut applicant's traversal?	11 Yes	12 No	52 N/A
	B.	Did Examiner Make requirement final?	9 Yes	15 No	55 N/A
	C.	Modified?	3 Yes	11 No	
	D.	Withdrawn?	8 Yes	7 No	
	9.	Other			
	10.	Based on the record is the restriction requirement prima facie reasonable?	73 Yes	11 No	(5)*
	11.	Comments:			

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*( ) withdrawn

Restriction Practice Survey—Feb. 1985 **MECHANICAL**

Serial No._____ Art Unit_____ Reviewer_____

Indicate type of Restriction or other requirement by checking box(s). Explain any deficiencies in Comments (Item 11).

	1.	Telephone	21 Yes	82 No	
43	2.	Generic Claim, Election of Species			
–	2a.	Markush-Type, Plurality of Patentably Distinct Inventions			
12	3.	No Generic Claim Present, Election of Species			
	4a.	Were the inventions properly grouped?	82 Yes	10 No	
	4b.	Were linking claims properly identified and grouped?	36 Yes	6 No	46 N/A
	5.	Reasons for Separate and Distinct Inventions			
		– a. Intermediate- Final Product			
		19 b. Combination- Subcombination			
		10 c. Subcombination, Useable Together			
		15 d. Process and Apparatus			
		18 e. Product and Process of Making			
		2 f. Apparatus and Product Made			
		– g. Product and Process of Using			
		– h. Product, Process of Using and Process of Making			
		i. Conclusion to all Restriction Requirements proper?	88 Yes	– No	
		j. Were Examiner's reasons reasonable?	86 Yes	14 No	
	6.	Requirement, When Mailed			
	A.	Was election required?	96 Yes	6 No	
	B.	30 day period set?	95 Yes	7 No	
		If other than 30 day period indicate_____			
	7A.	Was there a response to the requirement?	98 Yes	4 No	
	B.	Was an election made?	98 Yes	– No	
	C.	Was requirement traversed?	39 Yes	58 No	
	D.	Was traversal based on allegation that:			
		– 1. PTO policy is wrong			
		26 2. Examiner reasoning is wrong			
		17 3. No burden on examiner			
		2 4. Other_____			
	8.	Further action by Examiner			
	A.	Did Examiner rebut applicant's traversal?	18 Yes	9 No	36 N/A
	B.	Did Examiner Make requirement final?	14 Yes	10 No	40 N/A
	C.	Modified?	4 Yes	33 No	
	D.	Withdrawn?	5 Yes	27 No	
	9.	Other			
	10.	Based on the record is the restriction requirement prima facie reasonable?	95 Yes	7 No	(3)*
	11.	Comments:			

*( ) withdrawn

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
[Docket no. 41269–5018]
Final Rules for Miscellaneous Patent Provisions

Agency: Patent and Trademark Office, Commerce
Action: Notice of final rulemaking
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part I of Title 37, Code of Federal Regulations, to provide rules and procedures for the miscellaneous patent provisions enacted into law by Public Laws 98–620 and 98–622, on Nov. 8, 1984, in which statutory invention registrations, changes in appeals to the courts, prior art and joint inventor provisions and PCT international application filing and processing procedures were established or amended. The rulemaking provides specific rules and procedures for the new and amended provisions.
Effective Date: May 8, 1985
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557–3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to establish a set of rules and procedures for the various requirements of Public Laws 98–620 and 98–622 concerning appeals to the courts, statutory invention registrations, rejections based on prior art and double patenting, and filing of international applications under the Patent Cooperation Treaty. The proposed rules were published on Jan. 25, 1985 in Volume 50 of the Federal Register, pages 3712 through 3725. A public hearing was held on the proposed rule changes on Feb. 8, 1985.
Background Information: Most of the rule changes contained herein are necessary as a result of Public Laws 98–620 or 98–622, both of which were signed by President Reagan on Nov. 8, 1984. The following is a summary of the purposes of the various statutory amendments.

Amended 35 U.S.C. 103 - Unpublished knowledge of prior art.

Public Law 98–622 changes a complex body of case law which discourages communication among members of research teams working in corporations, universities or other organizations. It amended 35 U.S.C. section 103 by adding a new sentence which provides that subject matter developed by another which qualifies as "prior art" only under subsections 102(f) or (g) of 35 U.S.C. is not to be considered when determining whether an invention sought to be patented is obvious under 35 U.S.C. 103, provided the subject matter and the claimed

invention were commonly owned at the time the invention was made.

"Prior art" is the existing body of technical information against which the patentability of an invention is judged. Publicly known information is always considered in determining whether an invention would have been obvious. However, under *In re Bass*, 474 F. 2d 1276, 177 USPQ 178 (CCPA 1973), and *In re Clemens*, 622 F.2d 1029, 206 USPQ 289 (CCPA 1980), an earlier invention which is not public could have been treated under 35 U.S.C. 102(g), and possibly under 102(f), as prior art with respect to a later invention made by another employee of the same organization.

New technology often is developed by using background scientific or technical information known within an organization but unknown to the public. Public Law 98–622, by disqualifying such background information from prior art, encourages communication among members of research teams, and leads to more public dissemination through patents of the results of team research.

The subject matter that is disqualified as prior art under 35 U.S.C. 103 is strictly limited to subject matter that qualifies as prior art only under 35 U.S.C. 102(f) or 102(g). If the subject matter qualifies as prior art under any other subsection—e.g., subsection 102(a), 102(b) or 102(e)—it will not be disqualified as prior art under the amendment to section 103.

The contents of a patent of the same or different ownership as an application, continues to be available as prior art against the application under section 103 by virtue of section 102(e) as of the application filing date of the patent. If subject matter becomes potential prior art under section 102 (e) because a patent application is filed on such subject matter before a commonly owned claimed invention is made the subject matter of a later application the two applications may be combined (under amended §§116 and 120) into a single application and such subject matter (with the abandonment of the two applications) would no longer constitute potential prior art under section 102(e) or under section 103 since it would not be "described in a patent granted on an application for patent by another."

It is important to recognize that the amendment to the law applies only to consideration of prior art for purposes of section 103. It does not apply to or affect subject matter which qualifies as prior art under section 102. A patent applicant urging that subject matter is disqualified has the burden of establishing that it was commonly owned at the time the claimed invention was made.

Public Law 98–622 was not intended to permit anyone other than the inventors to be named in a patent application or patent. Also, the amendment was not intended to enable appropriation of the invention of another.

The Patent and Trademark Office has withdrawn the Commissioner's Notice of Jan. 9, 1967, "Double Patenting", 834 O.G. 1615 (Jan. 31, 1967), to the extent that it does not authorize a double patenting rejection where different inventive entities are present. See the Commissioner's Notice of Dec. 11, 1984, "Initial Guidelines Implementing Changes in 35 U.S.C. 103, 116, and 120", 1050 O.G. 316 (Jan. 8, 1985). The Office is reinstituting, in appropriate circumstances, the practice of rejecting claims in commonly owned applications of different inventive entities on the ground of double patenting. See 130 Cong. Rec. H 10527, column 3 (daily ed. Oct. 1, 1984) (statement of Rep. Kastenmeier); *In re Rogers*, 394 F.2d 566, 567 n. 4, 157 USPQ 569, 570 n. 4 (CCPA 1964). This is in accordance with existing case law and prevents an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. See *In re Zickendraht*, 319 F.2d 225, 138 USPQ 22 (CCPA 1963) ("The doctrine is well established that claims in different applications need be more than merely different in form or content; and that *patentable distinction* must exist to entitle applicants to a second patent") and *In re Christensen*, 330 F.2d 652, 141 USPQ 295 (CCPA 1964) (". . . the correct procedure for double patenting cases is to analyze the claims to determine the inventions defined therein, and then decide whether such inventions, as claimed are *patentably distinct* and therefore qualified to be claimed in separate patents"). In accordance with established patent law doctrines, double patenting rejections can be overcome in certain circumstances by disclaiming, pursuant to the existing provisions of 37 CFR 1.321, the terminal portion of the term of the later patent and including in the disclaimer a provision that the patent shall be enforceable only for and during the period the patent is commonly owned with the application or patent which formed the basis for the rejection, thereby eliminating the problem of extending patent life.

Information learned from or transmitted to persons outside the organization is not disqualified as prior art.

The term "subject matter" will be construed broadly, in the same manner the term is construed in the remainder of §103. The term "another" as used in §103 means any inventive entity other than the inventor and would include the inventor and any other persons. The term "developed" is to be read broadly and is not limited by the manner in which the development occurred. The term "commonly owned" means wholly owned by the same person, persons, or organization at the time the invention was made.

Amended 35 U.S.C. 116 - Joint inventor filing

35 U.S.C. 116 as amended by Public Law 98–622 recognizes the realities of modern team research. A research project may include many inventions. Some inventions may have contributions made by individuals who are not involved in other, related inventions.

Amended 35 U.S.C. 116 allows inventors to apply for a patent jointly even though (i) they did not physically work together or at the same time, (ii) each did not make the same type or amount of contribution, or (iii) each did not make a contribution to the subject matter of every claim of the patent. Items (i) and (ii) adopt the rationale stated in decisions such as *Monsanto* v. *Kamp*, 269 F. Supp. 818, 154 USPQ 259 (D.D.C. 1967). Item (iii) adopts the rationale of cases such as *SAB Industries AB* v. *Bendix Corp.*, 199 USPQ 95 (E.D. Va. 1978).

Like other patent applications, jointly-filed applications are subject to the requirements of 35 U.S.C. 121 that an application be directed to only a single invention. If more than one invention is included in the application, the Patent and Trademark Office may require the application to be restricted to one of the inventions. In such a case, a "divisional" application complying with 35 U.S.C. 120 would be entitled to the benefit of the earlier filing date of the original application.

It is possible that different claims of an application or patent may have different dates of invention even though the patent covers only one independent and distinct invention within the meaning of 35 U.S.C. 121. When necessary, the Patent and Trademark Office or a court may inquire of the patent application or owner concerning the inventors and the invention dates for the subject matter of the various claims.

Amended 35 U.S.C. 120 - Benefit of prior U.S. application

35 U.S.C. 120 was amended by Public Law 98–622 to provide that an application can obtain the benefit of the filing date of an earlier application when not all inventors named in the joint application are the same as those named in the earlier application. This amendment permits greater latitude in filing "divisional" applications. For example, if the previously filed application named inventors A and B as the inventors, a later application by either A or B could be filed during the pendency of the previously filed application and claim benefit of the previously filed application. In order for a claim to be entitled to the benefit of an earlier pending application, the subject matter of the claim of the later application would have to be disclosed in the earlier application.

Similarly, if inventor A filed an application on an in-

vention and during the pendency of that application made an improvement on the subject matter of the application as a joint inventor with inventor B, the joint application filed on behalf of inventors A and B could claim the benefit of A's previously filed sole application to the extent that the later filed joint application contained claims directed solely to A's subject matter which was disclosed in the earlier filed pending application in the manner provided by the first paragraph of section 112 of title 35, U.S.C.

Likewise, an application filed by inventors A and C could claim the benefit of an earlier filed pending application of inventors A and B, to the extent that the requirements of section 120 could be met.

Like other patent applications, jointly-filed applications will continue to be subject to the requirement of 35 U.S.C. 121 that an application be directed to only a single invention. If more than one invention is included in the application, the Patent and Trademark Office may require the application to be restricted to one of the inventions. In such a case, a "divisional" application would be entitled to the benefit of the earlier filing date of the original application.

New 35 U.S.C. 157 - Statutory Invention Registration (SIR)

This section which is effective on May 8, 1985, establishes an optional procedure by which an inventor may secure protection which is strictly defensive in nature.

Under current law, there is no simple, practical method by which an inventor can protect his or her ability to exploit the invention without obtaining a patent. The new procedure confers on an inventor the same defensive rights that a patent provides to prevent others from patenting the invention. However, it does not permit the holder to exclude others from making, using or selling the invention.

Due to the fact that a SIR does not grant an exclusive right to an inventor, it is not necessary to subject a SIR to the lengthy examination process required for the granting of a patent. Such an examination is necessary if the SIR is subject to an interference proceeding to determine priority of invention. In all other instances, the Patent and Trademark Office will only review the application for adherence to formal printing and fee payment requirements and to ensure that the requirements of 35 U.S.C. 112 are satisfied.

An applicant desiring to have a SIR published will be required to file a regular complete application for a patent and to execute a request including a waiver of enforcement of patent rights. This waiver of the claimed invention will be effective at the time of publication. The original application can be abandoned in favor of a continuing application for a patent, claiming the filing date of the earlier filed application, by filing an express abandonment of the original application and a timely request or petition to withdraw the request for a SIR prior to publication of the SIR, thereby providing the applicant with flexibility during the pendency period of the application. Until the SIR is published the application remains an application for a patent. However, the holder of a SIR will not be able to file a reissue application to recapture the rights to exclusive use that were waived by the initial publication of the SIR.

The waiver of the right to receive a patent, required of all applicants electing to receive a SIR, applies to those remedies provided for the enforcement of a patent under section 183 and sections 271 through 289 of title 35, United States Code. The waiver also applies to remedies under other titles of the United States Code including sections 1337 and 1337a of title 19, section 2356 of title 22, and section 1498 of title 28. This waiver of enforcement applies only to the claimed subject matter of the SIR and not to any foreign patent arising from an application which might have served as the basis of a priority claim under the Paris Convention for the Protection of Industrial Property. Likewise, the waiver does not prevent the holder of a SIR from asserting any defenses provided in sections 271 through 289 of title 35, U.S.C. with respect to a charge of infringement of any other patent.

The Commissioner of Patents and Trademarks can refuse to accept the waiver in certain cases. For example, the waiver could not be accepted if the waiver is not a waiver of all the previously mentioned rights. The Commissioner also has discretion, which has not been exercised at this time, to set time limits on the waiver. This would allow the Commissioner to limit the ability of an inventor to keep inventions secret through a series of continuing patent applications followed by a conversion to a SIR.

The waiver of patent rights in the SIR to the subject matter claimed therein may affect the patentability of a claim in other related applications, particularly divisional applications, since the waiver of patent rights would be effective for all inventions claimed in the SIR and would be effective as a waiver of the right of the inventor to obtain a patent on the invention claimed in the same application or any other application, but not in any patent issued before the date the SIR is published. Where an application containing generic claims is published as a SIR, the waiver in that application applies to any other related applications, including divisions, continuations, and continuations-in-part, to the extent that the same invention claimed in the SIR is also claimed in the other related application.

The Patent and Trademark Office will apply standards similar to those which it applies in making determinations of "same invention" double patenting for purposes of determining whether or not a waiver by an inventor to claims in a SIR precludes patenting by the same inventor to subject matter in any other related application.

Therefore, the waiver would preclude patenting of an invention claimed by an inventor in a related application which is the same as the invention claimed by the same inventor in the SIR. When making this determination it is the claimed subject matter of the related application. Where the subject matter claimed in the related application is the same as the subject matter waived in the SIR, i.e., the "same invention" in the double patenting sense, the claims of the related application will be rejected as being precluded by the waiver in the SIR and cannot be overcome by a terminal disclaimer. The limitation of the scope of the waiver to the claimed invention would not affect the application of existing §1.658(c) should the SIR become involved in an interference. If a divisional application is filed and published as a SIR claiming only a method, publication thereof will not normally effect a waiver on an application for a patent claiming only an apparatus. The waiver in a SIR would not affect any rights in a patent which issued prior to the date of publication of the SIR, but would preclude an already issued patent from being broadened by reissue if the rights to the subject matter to which broadened claims relate have been waived by publication of the SIR. The waiver applies to any rights of the same inventor in any application pending when the SIR is published even if the inventor is a joint applicant in the pending application and was a sole applicant in the application published as a SIR. The waiver would not affect the rights of any other inventor even though those rights are commonly owned by the same person.

The holder of a SIR containing the required waiver will be left without the offensive rights associated with a patent. In other respects a SIR will be the same as a patent, including the application which is published as a SIR serving as the basis for a priority claim in a foreign application under the Paris Convention. A SIR will be treated the same as a U.S. patent for all defensive purposes. The application, and the SIR published therefrom, could become involved in an interference; the SIR would be a "constructive reduction to practice" under 35 U.S.C. 102(g); it will be "prior art" under all applicable sections of 35 U.S.C. 102 including section 102(e); and it will be classified, cross-referenced and placed

in the search files, disseminated to foreign patent offices, stored in the Patent and Trademark Office computer tapes, made available in commercial data bases, and announced in the *Official Gazette* of the Patent and Trademark Office. A published SIR is intended to be a fully viable publication for defensive purposes, usable as a reference as of its filing date in the same manner as a patent. A SIR will also serve as a basis to initiate or participate in an interference or priority proceeding under 35 U.S.C. 291 in a manner similar to a patent and can be used as a reference in defense of an infringement suit.

A SIR is based on a regularly filed application for a patent. Therefore, the filing date of the application will be a sufficient basis for a priority claim in a foreign application. Article 4, section A(3) of the Paris Convention states:

> "By a regular national filing is meant any filing that is adequate to establish the date on which the application was filed in the country concerned, whatever may be the subsequent fate of the application."

After a SIR is published, markings such as "patent pending" are improper under section 292 of title 35 of the United States Code.

The SIR will serve as a replacement for the current "defensive publication program" which was established by regulation under 37 CFR 1.139. Although publication under the "defensive publication program" was intended to provide rights similar to those of the SIR, publication under that program has been held not to be available as evidence of prior knowledge as of its filing date under section 102(a) of title 35, U.S.C. (*Ex parte Osmond*, 191 USPQ 334 (P.T.O. Bd. App. 1976)). The use of a "defensive publication" as a reference to prevent a patent from issuing on a subsequent application is therefore limited. A SIR, on the other hand, will have a clear statutory basis in title 35, U.S.C. The SIR will be "prior art" and a "constructive reduction to practice" under section 102(a) and section 102(g), respectively, as of the filing date of the application on which it is based.

A SIR will not be subject to reexamination under sections 302 to 307 of title 35, United States Code.

The Commissioner is authorized to issue SIRs for defensive purposes, but is not required to do so. The Commissioner has discretion in determining whether or not a SIR should be issued on a particular application. In circumstances where the subject matter is obviously not an invention, is too informal to print, and so forth, the Commissioner has the right to refuse to publish the SIR.

SIRs will be published sooner than patents because no substantive examination will normally be required for SIRs. To the extent that examination is required, it will be conducted in the same manner as in any other patent application. Maintenance fees will not be charged for SIRs.

Since the fees set by the Commissioner for the new SIR procedure under section 157 of title 35, U.S.C. are not established under section 41(a) or (b) of that title, they are not subject to reduction if the applicant has small entity status.

If the fee for requesting publication is not paid at the time of filing of the waiver of the right to receive a patent, the Commissioner may set a period within which the fee must be paid to prevent abandonment of the application. Such a period would be subject to petitions and fees for extensions of time. If abandonment should occur, the application may be revived.

In the final analysis, the SIR procedures set forth in the law should give inventors defensive protection more cheaply than they could get by obtaining a patent. The procedure will allow the government and the private sector to make inventions public knowledge. Last, the SIR would be particularly useful to those with limited resources such as universities and small businesses, who have a new, less expensive alternative to the traditional patenting of inventions.

Amended 35 U.S.C. 361, 366, 371, 372 and 376 - Miscellaneous provisions relating to the applications under the Patent Cooperation Treaty.

Section 361(d) of title 35, United States Code, was amended effective May 8, 1985, to provide a one-month grace period from the date of filing an international application for payment of the basic international fee and the transmittal and search fees.

Section 366 of title 35, United States Code, was amended, effective May 8, 1985, to clarify the effect of withdrawal of an international application on claims for the benefit of its filing date. The withdrawal of an international application designating the United States will not deprive an applicant of the right to claim the benefit of the filing date of such an international application in a later filed application, provided the claim for benefit is made before that international application is withdrawn. Stated otherwise, this clarifies that withdrawing the designation of the United States in an international application is comparable to abandoning a national application as far as a claim for an earlier filing date is concerned.

National Stage

As a general proposition, the amendments made to 35 U.S.C. 371 set forth a legislative scheme, effective May 8, 1985, to provide greater flexibility in the Patent and Trademark Office for the handling of international applications. In addition, by relaxing the requirements which international applicants must satisfy by the commencement of the national stage, the amendments give international applicants benefits similar to those given national applications by section 111, 35 U.S.C. as amended by Public Law 97-247 with respect to the time for filing the national fee and oath or declaration.

Section 372(b) of title 35, United States Code, is amended, effective May 8, 1985, to authorize the Commissioner to require a verification of the translation of an international application or any other document pertaining thereto if the application or other document was filed in a language other than English. An authorization for the Commissioner to require verification in appropriate cases is necessary since subsection (c)(2) of section 371 was amended to remove the requirement that the translation be verified in all cases.

Section 372(c) of title 35, United States Code, was deleted thereby discontinuing the requirement for payment of a special fee to maintain claims in an international application which were not searched by an international searching authority. This deletion was made to place international applications processed in the national stage on the same footing as purely national applications.

Section 376(a) of title 35, United States Code, was also amended by Public Law 98-622 to delete mention of the special fee in order to conform with the amendment of section 372(c).

Discussion of Specific Rules

Section 1.11 is amended as proposed to add a reference to published statutory invention registrations in paragraph (a) to indicate that they are available to the public. The portion of present §1.11(a) which deals with interferences is transferred to a new paragraph (e) and rewritten.

The amendment to paragraph (b) deletes reference to §1.139, which is being deleted in favor of the SIR, and inserts language which covers opening to the public defensive publications published under §1.139 as well as other applications laid open to the public such as the previously published abstracts and abbreviatures.

Section 1.11 is amended as proposed to delete the word "general" before public as unnecessary.

New paragraph (e) of §1.11 is added to cover the availability to the public of all interferences, including those which involved a statutory invention registration. This paragraph applies to interferences declared under the new rules which became effective on Feb. 11, 1985, 49 F.R. 48416, (Dec. 12, 1984) as well as the rules formerly in effect. The term "award of priority" is intended to refer to those decisions of the Board of Patent Interferences, or Board of Patent Appeals and Inter-

ferences, awarding priority in interferences conducted under the former rules. The term "judgment" refers to judgments entered by the Board of Patent Appeals and Interferences in interferences conducted under the new rules. The language of the proposed rule has been slightly modified for clarity in the final rule.

Section 1.14 is amended as proposed to delete reference to §1.139 since that section is being removed.

Section 1.17 paragraph (h) is amended as proposed to include the petition fee required by new §1.295.

Section 1.17 is amended to add new paragraphs (n) and (o) to establish fees for requesting publication of statutory invention registrations. Paragraph (n) establishes a $400.00 fee for requesting publication of a statutory invention registration where no first examiner's action pursuant to §1.104 has been issued in the application. The amount paid for basic filing fees under §1.16(a), (f) or (g) will be credited against this amount. For example, if a $300.00 filing fee was paid, only $100.00 additional would be required for requesting publication of a statutory invention registration.

The addition of paragraph (o) to §1.17 is similar to the addition of paragraph (n) but establishes a fee for requesting publication of applications, which have received any examiner's action pursuant to §1.104, as a statutory invention registration. The higher fee of $800.00 set in paragraph (o) is necessary in view of the expenditure of additional Office resources in examining the application prior to the filing of the request for a statutory invention registration.

Section 1.19 is amended as proposed to provide in paragraph (a)(1) a reference to the cost of a printed copy of a statutory invention registration and in paragraph (e) to provide reference to statutory invention registrations listed by subclass.

Section 1.20 is amended as proposed to delete the requirement to pay maintenance fees in all plant patents in view of the amendment in Public Law 98–622. Paragraph 1.20(m) is amended as proposed to provide that non-timely payment of maintenance fees may be accepted in patents based on applications filed prior to Aug. 27, 1982, in accordance with Public Law 98–622.

Public Law 98–622 provides that no maintenance fees are charged for plant patents, regardless of when filed. Without this provision that no maintenance fees be charged for plant patents, plant patent owners whose applications were filed between the dates of enactment of Public Law 96–517 and Public Law 97–247 (Dec. 12, 1980 to Aug. 27, 1982) would be subject to payment of maintenance fees, while plant patent owners whose applications were filed outside those dates would not be subject to such fees. Public Law 98–622 eliminates that inconsistency.

Section 1.45 is amended as proposed to reflect the change made by Public Law 98–622 in 35 U.S.C. 116. The previously existing paragraph is designated as paragraph (a). New paragraph (b) incorporates the wording added to 35 U.S.C. 116 by Public Law 98–622. New paragraph (c) indicates that each named inventor listed in an application must have made a contribution, individually or jointly, to the subject matter of at least one claim of the application and that the application will be considered to be a joint application under 35 U.S.C. 116.

Section 1.48 is amended to add new paragraphs (b) and (c). New paragraph (b) provides for deleting the names of persons originally properly included as inventors, but whose invention is no longer being claimed in the application. Such a situation would arise where claims have been amended or deleted because they are unpatentable or as a result of a requirement for restriction of the application to one invention, or for other reasons. Public Law 98–622 and §1.48(b) change the result reached in *Ex parte Lyon,* 146 USPQ 222, 1965 Dec. Comm'r. Pat. 362 (Bd. App. 1964). The final rule has fewer requirements than the proposed rule for correction of inventorship in this situation. The proposed rule would have required, in addition to the requirements of the final rule, an oath or declaration by each actual inventor or inventors as required by §1.63 and the written consent of any assignee. The final rule requires only a petition and fee with the petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application. The amendment would have to be diligently made under paragraph (b).

The final rule adds a paragraph (c) in response to a comment to provide for the situation where an application discloses unclaimed subject matter by an inventor or inventors not named in the application as filed. In such a situation, the application may be amended pursuant to paragraph (a) of §1.48 to add claims to the subject matter and also to name the correct inventors for the application. The claims would be added by an amendment and, in addition, an amendment pursuant to paragraph (a) of §1.48 would be required to correct the inventors named in the application. Any claims added to the application must be supported by the disclosure as filed and cannot add new matter.

Section 1.60 is amended to include wording which would permit an application to be filed under this section only if it named as inventors the same or less than all the inventors who were named and signed the oath or declaration in the prior application. This addition is necessary in view of the new provisions of 35 U.S.C. 120, as amended by Public Law 98–622, which permit continuing applications to be filed by different inventors. Under §1.60 additional inventors are not permitted to be named since the oath or declaration from the prior application is relied upon.

Section 1.61 is amended as proposed to incorporate the ability to file the translation, oath or declaration, and national fee after the 20 month deadline set forth in PCT Article 22(1) for entering the national phase in the United States Patent and Trademark Office.

Public Law 98–622 amended 35 U.S.C. 371(a) to provide greater flexibility for the PTO handling international applications. Also, 35 U.S.C. 371(a), by relaxing the requirements which international applicants must satisfy by the commencement of the national stage, gives international applicants benefits similar to those given national applicants under 35 U.S.C. 111 by P.L. 97–247 with respect to the time for filing the national fee and oath or declaration.

Paragraph (b) of §1.61 is amended to delete the 2 month time period to conform with the decision concerning PCT Article 22(2) adopted by the Assembly of the International Patent Cooperation Union (PCT Union) on Feb. 3, 1984. The amendment to the Article took effect on Jan. 1, 1985.

PCT Article 22(2) as amended, reads as follows:

> "Where the International Searching Authority makes a declaration, under Article 17(2)(a), that no international search report will be established, the time limit for performing the acts referred to in paragraph (1) of this Article shall be the same as that provided in paragraph (1)."

The additional wording to paragraph (b) of §1.61 sets forth the ability to comply with the requirements for entering the national phase before the Patent and Trademark Office as a Designated Office within 22 months of the priority date. If the national fee or oath or declaration is submitted later than 20 months after the priority date, a surcharge as set in §1.445(a) (5) is required to be paid. If a required English translation of the international application is filed later than 20 months after the priority date, a processing fee as set in §1.445(a) (6) is required to be paid.

New paragraph (c) of §1.61 provides that any amendments under PCT Article 19 which are not received along with any necessary English translation by the end of 20 months from the priority date will be considered as cancelled. This change is required in view of amended §371(d) of 35 U.S.C.

Paragraph (d) is added as proposed to §1.61 in view of §372(b) of title 35, United States Code, as amended by Public Law 98–622, which authorizes the Commissioner to require a verification of the translation of an international application or any other document pertain-

ing thereto if the application or other document was filed in a language other than English. An authorization for the Commissioner to require verification in appropriate cases was necessary since subsection (c) (2) of 35 U.S.C. 371 was amended to remove the requirement that the translation be verified in all cases.

Section 1.62 is amended by revising paragraphs (a), (c), and (h) to include wording which would permit a continuing application to be filed under this section by the same or less than all the same inventors who filed and signed the oath or delcaration in the prior application. This addition is necessary in view of the new provisions of 35 U.S.C. 120, as amended by Public Law 98-622, which permit continuing applications to be filed by different inventors. Under §1.62, additional inventors may be added only in applications in which a new oath or declaration is required because additional subject matter is being claimed. Paragraph (h) has been amended to also request applicants to furnish the title of the invention and the names of the applicants in the continuing application to permit the Office to enter this information in its records in the Application Branch.

Section 1.78 is amended to provide in paragraph (a) that the inventorship in the continuing application may be different from the inventorship in the prior copending application and that the prior application must disclose the invention claimed in at least one claim of the later filed application in the manner provided by the first paragraph of 35 U.S.C. 112. The requirement that at least one claim be fully supported in the prior application to be entitled to priority benefit is not new, but is included to serve as a reminder that information such as foreign patenting, publication, or public use or sale in the United States which occurred more than one year prior to the filing date of the later application is available as prior art where the claims of the continuation-in-part application are not fully supported by the disclosure of the parent application so as to be entitled to an earlier effective filing date under 35 U.S.C. 120. See *In re Ruscetta,* 255 F. 2d 687, 118 USPQ 101 (CCPA 1958); *In re van Langenhoven,* 458 F. 2d 132, 173 USPQ 426 (CCPA 1972), and *Chromalloy American Corp.* v. *Alloy Surfaces Co., Inc.,* 339 F. Suppl. 859, 173 USPQ 295 (D. Del. 1972).

Paragraph (c) as amended provides for the reply to an examiner's inquiry as to first inventor of conflicting claims in commonly owned applications or an application and a patent to be either (1) a statement that the inventions were both commonly owned at the time the later invention was made or (2) an indication of the first inventor. Paragraph (c) has been changed from that proposed in response to comments to clarify that common ownership or an obligation of assignment to the same person has to exist at the time the later invention was made. New paragraph (d) provides for making a double patenting rejection where an application claims an invention which is not patentably distinct from an invention claimed in a commonly-owned patent with the same or different inventive entities. An obviousness-type double patenting rejection could be overcome by the assignee by submitting a terminal disclaimer complying with §1.321(b).

Section 1.101 is amended as proposed to delete reference to applications filed under §1.139 since this section is being removed.

Section 1.103 is amended as proposed to refer in paragraph (d) to a request "for a defensive publication" rather than a request "filed under §1.139" since §1.139 is being removed. Paragraph (d) is amended as proposed to also refer to "patent interference proceedings under Subpart E" rather than to "proceedings under §1.201(b)" since §1.201(b) has been removed.

Section 1.104 is amended as proposed to add a new paragraph (e) to specify the nature of the showing necessary before the examiner would consider co-pending applications to be owned by, or subject to an obligation of assignment to, the same person for purposes of 35 U.S.C. 102(f)/103, 102(g)/103, and paragraph (d) of §1.106. The rule permits the necessary showing to be made in different alternative ways. The necessary showing will be considered by the examiner to be present if the application files refer to assignments which are recorded in the Patent and Trademark Office in accordance with §1.331 as long as the assignments conveyed the entire rights in the applications to the same person or organization. A second alternative which can be used, if assignments have not been recorded, permits the examiner to consider copies of unrecorded assignments filed in each of the applications by the applicants as long as the unrecorded assignments convey the entire rights in the applications to the same person or organization. A third alternative permits an affidavit or declaration to be filed by the common owner stating that there is common ownership and stating facts which explain why the affiant or declarant believes there is common ownership. Under this alternative, sufficient facts will have to be presented in order to enable the examiner to conclude that a prima facie case of common ownership exists. The fourth alternative permits other evidence to be used which would establish common ownership of the applications, e.g., a court decision determining the owner. The terms "person" and "organization" in the rule would include circumstances where the ownership resided in more than one person and/or organization as long as the applications are owned jointly by the same owners. Paragraph (e) also provides that where the common owner is a corporation or other organization an affidavit or declaration averring common ownership may be signed by an official of the corporation or organization who is empowered to act on behalf of the corporation or organization. A mere power of attorney to prosecute a patent application will not make an individual an official of the corporation or organization or empower the individual to act on behalf of the corporation or organization.

The wording of §1.106(d) amends the rule to reflect the change in 35 U.S.C. 103 and refers to the "entire" rights to the subject matter and the claimed invention to make it clear that the term "commonly owned" means wholly owned by the same person, persons, or organization.

If the person, persons, or organization owned less than 100 percent of the subject matter which would otherwise be prior art to the claimed invention, or less than 100 percent of the claimed invention, then common ownership would not exist. Common ownership requires that the person, persons, or organization own 100 percent of the subject matter and 100 percent of the claimed invention. As long as principal ownership rights to either the subject matter or the claimed invention reside in different persons or organizations common ownership does not exist. A license of the claimed invention to another by the owner where basic ownership rights are retained would not defeat ownership. The requirement for common ownership at the time the claimed invention was made is intended to preclude obtaining ownership of subject matter after the claimed invention was made in order to disqualify that subject matter as prior art against the claimed invention. The question of whether common ownership exists at the time the claimed invention was made is to be determined on the basis of the evidence presented and the facts of the particular case in question. Actual ownership of the subject matter and the claimed invention by the same individual or organization or a legal obligation to assign both the subject matter and the claimed invention to the same individual or organization must be in existence at the time the claimed invention was made in order for the subject matter to be disqualified as prior art. A moral or unenforceable obligation would not evidence common ownership.

The burden of establishing that subject matter is disqualified as prior art under the section is intended to be placed and reside upon the person or persons urging that the subject matter is disqualified. For example, the examiner would normally make what appears to be a proper 35 U.S.C. 102(f)/103 or 102(g)/103 rejection and the burden would be on the patent applicant to establish

that subject matter is disqualified as prior art because it was commonly owned at the time the claimed invention was made. To place the burden upon the patent examiner would not be appropriate since evidence as to common ownership at the time the claimed invention was made might not be available to the patent examiner, but such evidence, if it exists, should be readily available to the patent applicant or the patentee.

The invention is made for purposes of the amendment to §103 when the conception is complete as defined in *Mergenthaler* v. *Scudder,* 11 App. D.C. 264, 1897 C.D. 724 (C.A.D.C. 1897), and in *In re Tansel,* 117 USPQ 188 (CCPA 1958).

> "The conception of the invention consists in the complete performance of the mental part of the inventive act. All that remains to be accomplished in order to perfect the act or instrument belongs to the department of construction, not invention. It is, therefore, the formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention as it is thereafter to be applied in practice that constitutes an available conception within the meaning of the patent law."

Mergenthaler v. *Scudder,* supra, at page 731.

Paragraph (e) of §1.106 has been added in response to a comment that the rulemaking should leave no doubt as to the standard to be applied in determining the effect of a statutory invention registration waiver in one application on a related application. Paragraph (e) of §1.106 provides that the claims in any original application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the same subject matter is claimed in the application and the statutory invention registration. Paragraph (e) of §1.106 also provides that the claims in any reissue application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the reissue application seeks to claim subject matter which was not covered by claims issued in the patent prior to the date of publication of the statutory invention registration and which was the same subject matter waived in the statutory invention registration.

Section 1.108 is amended as proposed to delete the reference to filing a request under §1.139, which is being removed, and insert in its place a reference to a defensive publication.

A new section 1.110 is added as proposed to allow the examiner or other Office official to make inquiry as to the invention date, inventors and ownership at the time the invention was made when necessary for purposes of an Office proceeding.

Section 1.131 is amended to require that affidavits to overcome a rejection of a claim on a cited patent or publication be by the inventor or inventors of the subject matter of that claim. Section 1.131 has also been amended in response to a comment to permit the person qualified under §§1.42, 1.43, or 1.47 to make the required oath or declaration in appropriate circumstances.

Section 1.139 is being removed in view of the new statutory invention registration. The proposed rules made clear the intent to remove this section which established the defensive publication program although the section per se was not published as being removed. The defensive publication program is being replaced by the ability to obtain a statutory invention registration.

Section 1.193 is amended as proposed to change from twenty days to one month the time for filing a reply brief in response to an examiner's answer which raises new points of argument. This amendment is intended to simplify the docketing of this time period and make it consistent with the time period fixed for requesting an oral hearing in §1.194(b).

Section 1.293 is added to provide who may file a request for a statutory invention registration (SIR) and the requirements of such a request in accordance with 35 U.S.C. 157 added by Public Law 98–622. Paragraph (a) of §1.293 indicates that a request for publication of a statutory invention registration in a complete pending patent application for an original patent may be filed and be signed by the applicant, and any assignee of record, or the attorney or agent of record in the application. Paragraph (b) sets forth the requirements for a request for a statutory invention registration. Such a request must include:

(1) a waiver of the applicant's right to receive a patent. This waiver will become effective upon the date of publication. Therefore, it will be possible to petition to withdraw a request for publication of a statutory invention registration until such time that publication can not be terminated;
(2) payment of the fee for requesting publication of a statutory invention registration as set forth in §1.17(n) or (o). The fee is set at two levels to reflect the amount of resources used by the Patent and Trademark Office;
(3) a statement that the application meets the disclosure requirements of 35 U.S.C. 112. This provision is considered desirable in order to prevent publication of defective and insufficient disclosures; and
(4) a statement that the application complies with the formal requirements of the rules of practice relating to printing. This provision is required in order to provide the printer with drawings and specification which are suitable for printing in substantially the same format as a patent.

A suggested format for use in filing a request for a statutory invention registration is as follows:

Request for Statutory Invention Registration

Application Serial No. or [ ] Attached hereto
Filed:
Titled:
Applicants:

A. In the above identified patent application, I hereby
1. request and authorize the Commissioner of Patents and Trademarks to publish the above identified regularly filed patent application as a Statutory Invention Registration. (35 U.S.C. 157)
2. waive the right to receive a United States patent on the same invention claimed in the above identified patent application. These rights, which are waived, include those specified in 35 U.S.C. §183 and §§271 through 289 as well as all attributes specified for patents in any other provision of law other than title 35 United States Code. The waiver includes, but is not limited to, the remedies under 19 U.S.C. 1337 and 1337a, 22 U.S.C. 2356 and 28 U.S.C. 1498. (35 U.S.C. 157(c))
3. understand that the above waiver will be effective pursuant to 37 CFR 1.293 upon publication of the Statutory Invention Registration to waive the inventor's right to receive a United States patent on the invention claimed in the Statutory Invention Registration. (37 CFR 1.293(b) (1))
4. state that, in my opinion, the disclosure and claims of the above identified patent application meet the requirements of 35 U.S.C. 112. (37 CFR 1.293(b) (3))
5. state that, in my opinion, the above identified application complies with the requirements for printing as set forth in the Rules of Practice for Patent Cases, 37 CFR Part 1. (37 CFR 1.293(b) (4))
6. enclose the fee set forth in 37 CFR 1.17(n) or (o) for requesting publication of a Statutory Invention Registration.

[ ] A first examiner's action *has not* been mailed in the above application, 37 CFR 1.17(n) — $400.00 or
[ ] A first examiner's action *has* been mailed in the above application, 37 CFR 1.17(o) — $800.00
$_____

Minus Basic Filing Fee, if previously paid

	Small entity	Large entity
Basic filing fee for utility patent application set forth in 37 CFR 1.16(a)	[ ] $150.00	[ ] $300.00
Basic filing fee for design patent application set forth in 37 CFR 1.16(f)	[ ] $62.50	[ ] $125.00
Basic filing fee for plant patent application set forth in 37 CFR 1.16(g)	[ ] $100.00	[ ] $200.00

MINUS: $_____

Amount Due $_____

[ ] Amount enclosed by check or money order _____

[ ] Please charge Deposit Account No. _____ in the amount of _____

[ ] If payment of any additional fee is required for publication of the Statutory Invention Registration, charge such payment to Deposit Account No. _____.

B. For printing on the Statutory Invention Registration front page list below the name(s) of not more than 3 registered patent attorneys or agents OR alternatively, the name of the firm having as a member a registered patent attorney or agent. If no name is listed below, no name will be printed. _____

C. Name of assignee, if any, for printing on the Statutory Invention Registration _____

Address (City and State or Country) _____

State of incorporation, if assignee is a corporation _____

(signature(s) (37 CFR 1.293(a))

[ ] applicant(s) and any assignee

[ ] attorney or agent of record

Paragraph (c) of §1.293 is added to define the effects of a waiver filed with a request for a statutory invention registration. The waiver is effective, upon publication of the SIR, to waive the inventor's right to receive a patent on the invention claimed in the SIR in any application for an original patent which is pending on, or filed after, the date of publication of the SIR. The waiver will affect pending or later applications the inventor filed as a joint inventor with others, but will not affect an application of another person, even if the application and the SIR were commonly owned. The waiver will affect a reissue application of an earlier patent of the inventor only to the extent that the reissue application seeks to enlarge the scope of the claims. Paragraph (c) of §1.293 has been modified from the proposal by inclusion of a reference to §1.106(e).

Section 1.294 is added as proposed to provide in paragraph (a) for a review of the request for publication of a statutory invention registration and the patent application to which it is directed. The request will be examined to determine if the requirements of §1.293 have been met. The application to which the request is directed will be examined to determine (1) if the subject matter of the application is appropriate for publication, (2) if the requirements for publication are met, and (3) if the requirements of 35 U.S.C. 112 and §1.293 are met. Under 35 U.S.C. 157, the Commissioner is authorized to publish a statutory invention registration, but is not required to do so. Thus, the Commissioner has discretion in determining whether or not a statutory invention registration should be issued on a particular patent. In circumstances where the subject matter was obviously not a patentable invention, was too informal to print, and so forth, the request to publish the statutory invention registration will be refused.

Paragraph (b) of §1.294 provides for notifying applicant of the results of the examination of the request for publication of the statutory invention registration. Paragraph (c) of §1.294 provides for the issuance of a notice of the intent to publish a statutory invention registration once the request has been examined and approved.

Section 1.295 is added to provide for the review of a final refusal to publish a statutory invention registration. The review would be by petition to the Commissioner for matters other than those arising from a rejection pursuant to 35 U.S.C. 112 and by appeal for a rejection pursuant to 35 U.S.C. 112. The language of the final rule is slightly different from that proposed to emphasize that the Board either affirms or reverses decisions rather than rejections. Paragraph (a) also differs from the proposal by including, in response to a comment, a provision for requesting return of the petition fee if the necessity for the petition resulted from an error by the Patent and Trademark Office.

Section 1.296 has been modified from the proposal to provide a specific period during which a request for a statutory invention registration may be withdrawn. Under §1.296, as modified, a request for a statutory invention registration may be withdrawn, at applicant's option, prior to the date of the notice of intent to publish a statutory invention registraiton issued pursuant to §1.294(c) by filing a request to withdraw the request for publication of a statutory invention registration. An applicant filing such a request to withdraw may also, under §1.296, request a refund of any amount paid in excess of the application filing fee and a handling fee of $100.00 which will be retained by the Office. Any request to withdraw the request for publication of a statutory invention registration filed on or after the date of the notice of intent to publish pursuant to §1.294(c) must be in the form of a petition pursuant to §1.183 accompanied by the fee set forth in §1.17(h).

Section 1.297 is added to provide for the publication of the statutory invention registration and of the notice of its publication in the *Official Gazette*. In response to a comment, §1.297 has been modified so that the statement on the statutory invention registration will specifically state that the statutory invention registration is not a patent.

Sections 1.301, 1.302 and 1.304 are amended as proposed to delete the requirement to give reasons for appeal when filing an appeal to the Court of Appeals for the Federal Circuit in accordance with §414(a) of Public Law 98–620 which amended 35 U.S.C. 142, 143 and 144.

Section 1.378 is amended as proposed to delete from paragraph (a) the limitation that only applications filed on or after Aug. 27, 1982 may have the maintenance fee accepted after expiration of the patent. This change follows the change made by §404(b) of Public Law 98–622.

Section 1.431 is amended as proposed to provide for the later payment directly to the Receiving Office of the basic fee portion of the international fee and the transmittal and search fees within one month of the filing of an international application. The rule follows §361(d) of title 35 U.S.C. as amended by Public Law 98–622, to provide a one-month grace period from the date of filing of an international application for the payment of the basic international fee and the transmittal and search fees.

It should be noted that the designation fees continue to be required by 12 months after the priority date and that no subsequent grace period is provided in the Receiving Office for designation fees.

New paragraphs 1.431(d) and (e) incorporate into the regulations the provisions of PCT Rule 16 bis. Under these provisions the Receiving Office will charge any unpaid or insufficient fees to a deposit account maintained by the International Bureau. The applicant will then be notified by the International Bureau and be given one month to reimburse the amount charged plus a surcharge of 50%. The surcharge would not be less than 248 Swiss francs or more than 624 Swiss francs under the current fee schedule.

Section 1.445 is amended as proposed to clarify paragraph (a) (4) to clearly indicate that the national fee is

credited by an amount of $250 only one time where a $500 search fee has been paid to the Patent and Trademark Office to act as an international searching authority. This is consistent with current practice. The special fee provisions in paragraph (a) (5) are being deleted in view of §402(g) of Public Law 98–622 which deleted the fee in 35 U.S.C. 376(a) (5). The wording of §1.445(a) (5) sets forth the surcharge required for filing of a national fee or oath or declaration later than 20 months from the priority date. Paragraph (a) (6) of §1.445 is added to require a fee of $20.00 for filing an English translation of an international application later than 20 months after the priority date. This makes the practice in international applications consistent with that in national applications where a fee of $20.00 is charged under §1.17(k) for processing an application filed with a specification in a non-English language.

Section 1.446 is amended as proposed to clarify the refund of a portion of the $500 search fee toward payment of the national fee.

Section 1.451 is amended as proposed to correct a rule citation in paragraph (b) and to amend paragraph (c) to provide for supplying a copy of the priority document to the Receiving Office in conformance with revised PCT Rule 17.1.

Section 1.461 is amended as proposed to delete provisions which relate to the applicant transmitting the record copy to the International Bureau. Provisions for such alternative transmittal were deleted from PCT Rule 22, effective Jan. 1, 1985. Accordingly, since the PCT rules no longer provide for such transmittal, the provisions therefor in the U.S. rules are also being deleted.

Response to Comments on the Rules

Specific comments were received on a number of the proposed rule changes. Six letters submitting written comments were received. Oral testimony was presented by four persons at the public hearing conducted on Feb. 8, 1985 and the oral testimony of two of these persons (representing the American Intellectual Property Law Association and Intellectual Property Owners, Inc.) was supplemented by written statements. All of the written and oral comments were considered in adopting the changes set forth herein. Comments suggesting modifications to the proposed rules appear below with responses thereto.

Comment One Comment suggested that 37 CFR 1.11 be amended to create a waiver of secrecy of an application as of the date of filing of a notice of appeal to the Court of Appeals for the Federal Circuit. The comment suggests that secrecy could be maintained upon request by the appellant in such a situation.

Reply The change was not published in the proposed rulemaking and is considered to be too substantial a change to be adopted without publication as a proposal to allow public comment. Further, if the suggestion were adopted appellants might simply include a request for secrecy with every notice of appeal.

Comment One comment suggested that the $120.00 petition fee under §1.17(h) for review of a refusal to publish a statutory invention registration under §1.295 be returned to the petitioner if the refusal to publish is found to have occurred only through an administrative error of the PTO.

Reply This suggestion has been adopted by an additional sentence being added to §1.295(a).

Comment Three comments suggested that the proposed fees for a statutory invention registration were too high. One comment suggested the elimination of the fee proposed in §1.17(o).

Reply Although lower fees would certainly be preferred by the public, the Office must recover its costs of processing and publishing statutory invention registrations. The two levels of fees permit an applicant whose application has not had a first Office action mailed to pay a minimum amount while those filing a request for a statutory invention registration later would share the average additional costs. The amounts proposed are the current estimates of expected costs and cannot be reduced. This will become apparent when it is realized that about $250.00 of the $400.00 fee which has been established for requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to §1.104 is the cost of printing the statutory invention registration and does not include in-house publication staff costs. The remainder of the fee is used to cover the administrative processing costs and the limited examination which is required to be given pursuant to 35 U.S.C. 157. The higher fee of $800.00 which has been established is necessary to cover the additional costs to the Office when an applicant requests publication of a statutory invention registration after the office has begun examination of the application on which the applicant is requesting publication of a statutory invention registration. Since the rules permit the request to be filed at any time during the examination process substantial additional examination costs, including possibly appeal costs, may have been incurred in a particular application prior to the date on which the request for publication is made. Accordingly, the additional $400.00 is required to cover the extra costs to the Office where the applicant belatedly requests publication of a statutory invention registration. Applicants can avoid the higher costs to themselves and the Office by requesting publication of the statutory invention registration in a timely fashion prior to the mailing of the first examiner's action pursuant to §1.104. The possibility of reducing fees below costs to the Office does not exist since the legislative history of 35 U.S.C. 157 does not reflect any intent that other Office fees or appropriations be used to defer the costs of statutory invention registrations. Further, most of the comments received urged that the fees be set as low as possible, but not below the level necessary to recover costs.

Comment One comment suggested that the Patent and Trademark Office should investigate less expensive procedures for printing statutory invention registrations to reduce the costs and thereby lower the fees.

Reply If the registrations are not printed by a system using computer tape, the subject matter of the registrations would not be easily searchable in paper form and would not be fully available for searching under the planned automated "paperless" system. Further, the "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H. R. 6286 on the floor of the House stated that the statutory invention registration "would be classified and cross-referenced, disseminated to foreign patent offices, stored in the Patent and Trademark Office computer tapes, made available in commercial data bases, and announced in the *Official Gazette* of the PTO." (130 Cong. Rec. H 10526 (1984), column 3). These uses of the statutory invention registrations preclude use of any informal method of printing which would be different from the method used for the printing of patents.

Comment A number of comments were received concerning §1.48(b). The comments related to (1) the propriety of the fee required, (2) the incorporation of paragraph (b) into current §1.48, (3) the inclusion in the rules of a fixed and definite time period to correct inventorship, (4) the inclusion in the rules of a provision to add inventors claiming previously disclosed but unclaimed subject matter, and (5) a suggestion that the change in inventorship be simplified and possibly effected by a statement by applicant's attorney.

Reply Each comment will be treated separately in order. (1) The fee of $120.00 to accompany a petition for correction of inventorship is considered appropriate since the consideration of such a petition and correction of Office records takes additional resources. Such a fee should also act as a discouragement to grouping marginal inventions and loosely related inventions into the same application. (2) Whether paragraph (b) is made part of §1.48 or established as a separate rule does not appear to be a substantive matter. Paragraph (b) is being made part of §1.48 to place all rules relating to correction of inventorship in applications in a single rule. (3)

No specific time period for correction of inventorship was indicated in the proposed rules. The rule requires that the correction must be made diligently. Since the examiner will not normally be aware of when inventorship correction is required, the responsibility of making such a correction diligently must rest with the applicant. The time of the correction will vary from case to case. (4) The addition of claims to previously disclosed but unclaimed subject matter of additional inventors is considered to be an error in the application and is therefore corrected under §1.48(a). A new paragraph (c) has been added to §1.48 to make this clear. Such a correction must always include a new oath or declaration. (5) The correction of inventorship has been simplified from that proposed. Final §1.48(b) does not require a new oath or declaration of each actual inventor or written consent of any assignee as originally proposed. The final rule requires a petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application, and the fee set forth in §1.17(h). The petition could be signed by applicant's attorney who would then take full responsibility for ensuring that the inventor is not being improperly deleted from the application.

Comment One comment suggested that proposed §§1.60 and 1.62 should be modified to permit the filing of such continuing applications with different inventive entities from the prior application.

Reply The procedures under §§1.60 and 1.62 were developed to allow continuing applications to be filed without the necessity of again obtaining an inventor's signature to a declaration. The proposed rule wording has been modified in the final rule to permit inventors to be deleted in the continuing application. The addition of inventors is now permitted where a new oath or declaration would be required because of claims in the continuing application being drawn to additional subject matter.

Comment One comment suggested that §§1.77 and 1.78 be modified to change the placement in a patent application of the information regarding cross-reference to related applications. It was suggested to require this information to be placed immediately after the Abstract, following the claims, so that the cross-reference information could be easily removed when filing the application outside the United States.

Reply These changes were not included in the proposed rulemaking and therefore the public has not had an opportunity to comment on the suggestion. Accordingly, the suggestion has not been adopted.

Comment One comment suggested that proposed §1.78(c) be modified to permit a statement that the claimed inventions were subject to an obligation of assignment to the same person at the time the inventions were made.

Reply The suggestion has been adopted.

Comment One comment suggested that the application of double patenting rejections to applications of different inventive entities which are commonly owned as set out in proposed §1.78(d) not be made until the effective date of this rulemaking.

Reply The Commissioner's Notice of Dec. 11, 1984, "Initial Guidelines Implementing Changes in 35 U.S.C. 103, 116, and 120", 1050 O.G. 316 (Jan. 8, 1985), changed the practice in accordance with the intention of Congress in enacting Public Law 98–622. See 130 Cong. Rec. H 10527, column 3 (daily ed. Oct. 1, 1984) (statement of Rep. Kastenmeier) wherein the following statement appears:

> "The Committee expects that the Patent and Trademark Office will reinstitute in appropriate circumstances the practice of rejecting claims in commonly owned applications of different inventive entities on the ground of double patenting. This will be necessary in order to prevent an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. In accordance with established patent law doctrines, double patenting rejections can be overcome in certain circumstances by disclaiming the terminal portion of the term of the later patent, thereby eliminating the problem of extending patent life."

Since the provisions of Public Law 98–622 became effective on Nov. 8, 1984, it was not appropriate to delay the change in practice.

Comment One comment suggested that the policy of rejecting commonly-owned applications of different inventive entities on the grounds of double patenting, as set forth in proposed §1.78(d), was unnecessary in view of 35 U.S.C. 102(e).

Reply The provisions of 35 U.S.C. 102(e) will not be effective to preclude double patenting in situations where the applicants of the later filed application can use the provisions of 37 CFR 1.131 to antedate the filing date of the earlier filed application or patent. Accordingly, the application of the prohibitions against double patenting is necessary in order to prevent an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. See 130 Cong. Rec. H 10527, supra.

Comment One comment suggested that proposed §1.78(c) was broader than required by statute and capable of being construed to conflict with proposed §1.106(d) by referring to common ownership at "the time the inventions were made" rather than at the time the later invention was made.

Reply The wording of §1.78(c) has been revised from the proposal to clarify the problem spoken to in the comment.

Comment One comment suggested that the proposed amendment to §1.131 not be made so that the "applicant" can make affidavits or declarations to overcome rejections. The comment suggested that the proposed rule provides no remedy in situations where the inventor is dead, insane, legally incapacitated, cannot be reached or refuses to join in the application.

Reply The final rule has been changed in response to the comment to permit the person qualified under §§1.42, 1.43, or 1.47 to make the required oath or declaration in appropriate circumstances.

Comment Two comments suggested that the scope of the waiver in a statutory invention registration be limited to the subject matter of the claims of the statutory invention registration and not to any obvious modifications thereof. Another comment suggested that the statutory invention registration applicant should be able to waive the right to a patent on all of the subject matter disclosed in the application if he wishes to do so. One comment suggested that the rulemaking should leave no doubt as to the standard to be applied in determining the effect of a statutory invention registration waiver in one application on a related application.

Reply A new paragraph (e) has been added to §1.106 to clarify the standard to be applied in determining the effect of a statutory invention registration waiver. The suggestion that the scope of the waiver be limited to the subject matter of the claims of the statutory invention registration and not to any obvious modifications thereof has been adopted.

Comment Three comments suggested that since a statutory invention registration is prior art as of its effective filing date, the time permitted between the effective filing date and the publication of the statutory invention registration should be limited. Several different approaches were suggested. One comment suggested that there was no problem in this regard. Another comment suggested that the organization is studying the question and will have recommendations in several months.

Reply The statute makes it clear that the Commissioner is not required to publish a statutory invention registration in response to a request therefor. The case-by-case consideration of requests for publication of a statutory invention registration should safeguard the public without unduly placing limits on patent applicants. The Office will await further recommendations on this ques-

tion and will observe actual experience prior to placing any time limitations on the use of statutory invention registrations.

Comment Two comments suggested that §1.293 be modified to eliminate the requirement for a statement in the request for publication of a statutory invention registration that the application meets the requirements of 35 U.S.C. 112. One of these comments also suggested the elimination of the statement that the application meets formal requirements for printing. One comment suggested that if there is a requirement for a statement in the request for publication of a statutory invention registration that the application meets the requirements of 35 U.S.C. 112, there will not be a great necessity for the Office to spend a lot of time examining the application, although there has to be some examination.

Reply The reason for the statements in §1.293 regarding compliance with 35 U.S.C. 112 and the formal requirements for printing as a patent was to reduce the cost of statutory invention registrations to the applicants and to the Office. The level of fees which have been established assumes that applicants will include the statements required by §1.293 in their requests and that the statements will accurately reflect the condition of the applications to which the requests are directed.

Comment One comment suggested that the rules should include a fixed and definite time period in which an authorized party can withdraw a statutory invention registration after its approval and before its publication.

Reply The suggestion has been adopted. Section 1.296 has been modified to permit a request to withdraw the request for publication of a statutory invention registration to be filed at any time prior to the date of the notice of intent to publish the statutory invention registration. After the date of the notice of intent to publish the statutory invention registration, any request to withdraw the request for publication of the statutory invention registration must be in the form of a petition pursuant to §1.183 accompanied by the fee set forth in §1.17(h).

Comment One comment suggested that the statement to be printed on statutory invention registrations as set out in proposed §1.297(b) be modified to be easily understood by lay people.

Reply The statement has been modified to specifically state that the statutory invention registration is not a patent.

Environmental, Energy, and Other Considerations: The final rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). In fact, the rule change will benefit small entities since the statutory invention registration procedures will provide a new, less expensive alternative to the traditional patenting of inventions in appropriate circumstances. Further, the ability to join multiple inventors in a single application in appropriate circumstances will be of particular benefit to small entities. Other changes, such as the elimination of the reasons for appeal, will also be beneficial to all inventors. See a "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H.R. 6286 on the floor of the House in which the following statement appears (130 Cong. Rec. H 1057 (1984), column 1):

> "Last, the SIR would be particularly useful to those with limited resources such as universities and small businesses, who have a new less expensive alternative to the traditional patenting of inventions."

These rules, therefore, will have no significant adverse economic impact on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The information collection requirements contained in these rules were submitted to the Office of Management and Budget (OMB) at the time of the proposed rulemaking for review under Section 3504(h) of the Paperwork Reduction Act. OMB has approved the information collection requirements and has assigned OMB control number 0651-0018 thereto.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Pub. L. 98-620 and 98-622, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

1. Section 1.11 is amended by revising paragraphs (a) and (b) and adding new paragraph (e) to read as follows:

§1.11 Files open to the public.

(a) After a patent has been issued or a statutory invention registration has been published, the specification, drawings and all papers relating to the case in the file of the patent or statutory invention registration are open to inspection by the public, and copies may be obtained upon paying the fee therefor. See §2.27 for trademark files.

(b) All reissue applications, all applications in which the Office has accepted a request to open the complete application to inspection by the public, and related papers in the application file, are open to inspection by the public, and copies may be furnished upon paying the fee therefor. The filing of reissue applications will be announced in the *Official Gazette*. The announcement shall include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned.

* * * * *

(e) The file of any interference involving a patent, a statutory invention registration, or an application on which a patent has issued or which has been published as a statutory invention registration, is open to inspection by the public, and copies may be obtained upon paying the fee therefor, if: (1) the interference has terminated, or (2) an award of priority or judgment has been entered as to all parties and all counts.

2. Section 1.14 is amended by revising paragraph (b) to read as follows:

§1.14 Patent applications preserved in secrecy.

* * * * *

(b) Except as provided in §1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application in which the applicant has filed an authorization to open the complete applica-

tion to the public, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant.

* * * * *

3. Section 1.17 is amended by revising paragraph (h) and by adding new paragraphs (n) and (o) to read as follows:

§1.17 Patent application processing fees.

* * * * *

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $120.00

§1.47	— for filing by other than all the inventors or a person not the inventor
§1.48	— for correction of inventorship
§1.182	— for decision on questions not specifically provided for
§1.183	— to suspend the rules
§1.295	— for review of refusal to publish a statutory invention registration
§1.377	— for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent
§1.378(e)	— for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent
§1.644(e)	— for petition in an interference
§1.644(f)	— for request for reconsideration of a decision on petition in an interference
§1.666(c)	— for late filing of interference settlement agreement
§§5.12, 5.13, & 5.14	— for expedited handling of foreign filing license
§5.15	— for changing the scope of a license
§5.25	— for retroactive license

* * * * *

(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's acton pursuant to §1.104 ..... $400.00 reduced by the amount of the application basic filing fee paid

(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to §1.104 ..... $800.00 reduced by the amount of the application basic filing fee paid

4. Section 1.19 is amended by revising paragraphs (a) and (e) to read as follows:

§1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Office documents:

(1) Printed copy of a patent, including a design patent, statutory invention registration, or defensive publication document, except color plant patent $1.00

* * * * *

(e) List of patents in subclass:

(1) For list of all United States patents and statutory invention registrations in a subclass, per 100 numbers or fraction thereof 2.00

(2) For list of United States patents and statutory invention registrations in a subclass limited by date or number, per 50 numbers or fraction thereof 2.00

5. Section 1.20 is amended by revising paragraphs (e), (f), (g) and (m) to read as follows:

§1.20 Post-issuance fees.

* * * * *

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant $200.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant 400.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant 600.00

* * * * *

(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable 500.00

6. Section 1.45 is revised by labeling the existing paragraph as (a) and by adding new paragraphs (b) and (c) to read as follows:

§1.45 Joint inventors.

(a) * * * * *

(b) Inventors may apply for a patent jointly even though

(1) they did not physically work together or at the same time,

(2) each inventor did not make the same type or amount of contribution, or

(3) each inventor did not make a contribution to the subject matter of every claim of the application.

(c) If multiple inventors are named in an application, each named inventor must have made a contribution, individually or jointly, to the subject matter of at least one claim of the application and the application will be considered to be a joint application under 35 U.S.C. 116.

7. Section 1.48 is amended by labeling the current paragraph as paragraph (a) and by adding new paragraphs (b) and (c) to read as follows:

§1.48 Correction of inventorship.

(a)

* * * * *

(b) If the correct inventors are named in the application when filed and the prosecution of the application re-

sults in the amendment or cancellation of claims so that less than all of the originally named inventors are the actual inventors of the invention being claimed in the application, an amendment shall be filed deleting the names of the person or persons who are not inventors of the invention being claimed. The amendment must be diligently made and shall be accompanied by:

(1) a petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application, and

(2) the fee set forth in §1.17(h).

(c) If an application discloses unclaimed subject matter by an inventor or inventors not named in the application, the application may be amended pursuant to paragraph (a) of this section to add claims to the subject matter and name the correct inventors for the application. [OMB Control No. 0651–0018].

8. Section 1.60 is revised to read as follows:

§1.60 Continuation or divisional application for invention disclosed in a prior application.

(a) A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and §1.78(a)), naming as inventors the same or less than all the inventors named in a prior application and which discloses and claims only subject matter disclosed in the prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application.

(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application if (1) the prior application was a complete application as set forth in §1.51(a), (2) applicant files a true copy of the prior complete application as filed including the specification (including claims), drawings, oath or declaration showing the signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application, and (3) the inventors named in the continuation or divisional application are the same or less than all the inventors named in the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§1.78(a)) will be entered before calculating the filing fee and granting the filing date. If the continuation or divisional application is filed by less than all the inventors named in the prior application a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation or divisional application.

9. Section 1.61 is amended by revising the section heading and paragraphs (a) and (b) and adding paragraphs (c) and (d) to read as follows:

§1.61 Filing of applications in the United States of America as a Designated Office.

(a) To maintain the benefit of the international filing date and obtain an examination as to the patentability of the invention in the United States, the applicant shall furnish to the U.S. Patent and Trademark Office not later than the expiration of 20 months from the priority date: (1) a copy of the international application with any amendments under PCT Article 19, unless it has been previously communicated by the International Bureau or unless it was originally filed in the U.S. Patent and Trademark Office; (2) a translation of the international application and a translation of any amendments under PCT Article 19 into the English language, if originally filed in another language; (3) the national fee (see §1.445(a)(4)); and (4) an oath or declaration of the inventor (see §1.70).

(b) If the translation of the international application, oath or declaration, and national fee have not been submitted by the applicant within twenty (20) months from the priority date, such requirements may be met within twenty-two (22) months from the priority date. The payment of the surcharge set forth in §1.445(a)(5) is required as a condition for accepting the national fee or the oath or declaration later than 20 months after the priority date. The payment of the processing fee set forth in §1.445(a)(6) is required for acceptance of an English translation later than 20 months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of §1.136 do not apply to the 22 month period of this section.

(c) If a copy of the amendments under PCT Article 19 is not communicated by the International Bureau or a copy thereof and any necessary English translation thereof is not received by the end of 20 months from the priority date, such failure will be regarded as cancellation of the amendments under PCT Article 19 in the international application.

(d) Verification of the translation of the international application or any other document pertaining to an international application may be required where it is considered necessary, if the international application or other document was filed in a language other than English.

10. Section 1.62 is amended by revising paragraphs (a), (c) and (h) to read as follows:

§1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification, drawings and oath or declaration from a prior complete application (§1.51(a)) which is to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior complete application. If the continuation, continuation-in-part, or divisional application is filed by less than all the inventors named in the prior application a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation, continuation-in-part, or divisional application.

* * * * *

(c) In the case of a continuation-in-part application which adds and claims additional disclosure by amendment, an oath or declaration as required by §1.63 must also be filed. In those situations where a new oath or declaration is required due to additional subject matter being claimed, additional inventors may be named in the continuing application. In a continuation or divisional application which discloses and claims only subject matter dislcosed in a prior application, no additional oath or declaration is required and the application must name as inventors the same or less than all the inventors named in the prior application.

* * * * *

(h) The applicant is urged to furnish the following information relating to the prior and continuing applications to the best of his or her ability:

* * * * *

(5) The title of the invention and names of the applicants to be named in the continuing application.

* * * * *

11. Section 1.78 is amended by revising paragraphs (a) and (c) and by adding a new paragraph (d) to read as follows:

§1.78 Claiming benefit of earlier filing date and cross-references to other applications.

(a) An application may claim an invention disclosed in a prior filed copending national application or international application designating the United States of America. In order for an application to claim the benefit of a prior filed copending national application, the prior application must name as an inventor at least one inventor named in the later filed application and disicose the named inventor's invention claimed in at least one claim of the later filed application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, the prior application must be (1) complete as set forth in §1.51, or (2) entitled to a filing date as set forth in §1.53(b) and include the basic filing fee set forth in §1.16; or (3) entitled to a filing date as set forth in §1.53(b) and have paid therein the processing and retention fee set forth in §1.21(1) within the time period set forth in §1.53(d). Any application claiming the benefit of a prior filed copending national or international application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See §1.14(b)).

* * * * *

(c) Where two or more applications, or an application and a patent naming different inventors and owned by the same party contain conflicting claims, and there is no statement of record indicating that the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, the assignee may be called upon to state whether the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, and if not, indicate which named inventor is the prior inventor. In addition to making said statement, the assignee may also explain why an interference should or should not be declared.

(d) Where an application claims an invention which is not patentably distinct from an invention claimed in a commonly owned patent with the same or a different inventive entity, a double patenting rejection will be made in the application. An obviousness-type double patenting rejection may be obviated by filing a terminal disclaimer in accordance with §1.321(b).

12. Section 1.101 is amended by revising paragraph (a) to read as follows:

§1.101 Order of examination.

(a) Applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to §1.102. International applications which have complied with the requirements of 35 U.S.C. 371(c) will be taken up for action based on the date on which such requirements were met. However, unless a request has been filed under 35 U.S.C. 371(f), no action may be taken prior to 21 months from the priority date.

* * * * *

13. Section 1.103 is amended by revising paragraph (d) to read as follows:

§1.103 Suspension of action.

* * * * *

(d) Action on applications in which the Office has accepted a request to publish a defensive publication will be suspended for the entire pendency of these applications except for purposes relating to patent interference proceedings under Subpart E.

14. Section 1.104 is amended by adding a new paragraph (e) immediately following the Note to paragraph (d) to read as follows:

§1.104 Nature of examination; examiner's action.

* * * * *

(e) Co-pending applications will be considered by the examiner to be owned by, or subject to an obligation of assignment to, the same person if (1) the application files refer to assignments recorded in the Patent and Trademark Office in accordance with §1.331 which convey the entire rights in the applications to the same person or organization; or (2) copies of unrecorded assignments which convey the entire rights in the applications to the same person or organization are filed in each of the applications; or (3) an affidavit or declaration by the common owner is filed which states that there is common ownership and states facts which explain why the affiant or declarant believes there is common ownership; or (4) other evidence is submitted which establishes common ownership of the applications. In circumstances where the common owner is a corporation or other organization an affidavit or declaration may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization.

15. Section 1.106 is amended by adding new paragraphs (d) and (e) to read as follows:

§1.106 Rejection of claims.

* * * * *

(d) Subject matter which is developed by another person which qualifies as prior art only under 35 U.S.C. 102 (f) or (g) may be used as prior art under 35 U.S.C. 103 against a claimed invention unless the entire rights to the subject matter and the claimed invention were commonly owned by the same person or organization or subject to an obligation of assignment to the same person or organization at the time the claimed invention was made.

(e) The claims in any original application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the same subject matter is claimed in the application and the statutory invention registration. The claims in any reissue applica-

tion naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the reissue application seeks to claim subject matter (1) which was not covered by claims issued in the patent prior to the date of publication of the statutory invention registration and (2) which was the same subject matter waived in the statutory invention registration.

16. Section 1.108 is revised to read as follows:

§1.108 Abandoned applications not cited.

Abandoned applications as such will not be cited as references except those which have been opened to inspection by the public following a defensive publication.

17. Section 1.110 is added to read as follows:

§1.110 Inventorship and date of invention of the subject matter of individual claims.

When more than one inventor is named in an application or patent, the Patent and Trademark Office, when necessary for purposes of an Office proceeding, may require an applicant, patentee, or owner to identify the inventive entity of the subject matter of each claim in the application or patent. Where appropriate, the invention dates of the subject matter of each claim and the ownership of the subject matter on the date of invention may be required of the applicant, patentee or owner. See also §§1.78(c) and (d). [OMB Control No. 0651-0018].

18. Section 1.131 is amended by revising paragraph (a) to read as follows:

§1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the rejected invention, or on reference to a foreign patent or to a printed publication, and the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the person qualified under §§1.42, 1.43 or 1.47, shall make oath or declaration as to facts showing a completion of the invention in this country before the filing date of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, then the patent or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

* * * * *

§1.139 [removed]

19. Section 1.139 is removed.

20. Section 1.193 is amended by revising paragraph (b) to read as follows:

§1.193 Examiner's answer.

* * * * *

(b) The appellant may file a reply brief directed only to such new points of argument as may be raised in the examiner's answer, within one month from the date of such answer. However, if the examiner's answer states a new ground of rejection appellant may file a reply thereto within two months from the date of such answer; such reply may include any amendment or material appropriate to the new ground.

* * * * *

21. A new section 1.293 is added to read as follows:

§1.293 Statutory invention registration.

(a) An applicant for an original patent may request, at any time during the pendency of applicant's pending complete application, that the specification and drawings be published as a statutory invention registration. Any such request must be signed by (1) the applicant and any assignee of record or (2) an attorney or agent of record in the application.

(b) Any request for publication of a statutory invention registration must include the following parts:
(1) a waiver of the applicant's right to receive a patent on the invention claimed effective upon the date of publication of the statutory invention registration;
(2) the required fee for filing a request for publication of a statutory invention registration as provided for in §1.17(n) or (o);
(3) a statement that, in the opinion of the requester, the application to which the request is directed meets the requirements of 35 U.S.C. 112; and
(4) a statement that, in the opinion of the requester, the application to which the request is directed complies with the formal requirements of this part for printing as a patent.

(c) A waiver filed with a request for a statutory invention registration will be effective, upon publication of the statutory invention registration, to waive the inventor's right to receive a patent on the invention claimed in the statutory invention registration, in any application for an original patent which is pending on, or filed after, the date of publication of the statutory invention registration. A waiver filed with a request for a statutory invention registration will not affect the rights of any other inventor even if the subject matter of the statutory invention registration and an application of another inventor are commonly owned. A waiver filed with a request for a statutory invention registration will not affect any rights in a patent to the inventor which issued prior to the date of publication of the statutory invention registration unless a reissue application is filed seeking to enlarge the scope of the claims of the patent. See also §1.106(e). [OMB Control No. 0651-0018].

22. A new section 1.294 is added to read as follows:

§1.294 Examination of request for publication of a statutory invention registration and patent application to which the request is directed.

(a) Any request for a statutory invention registration will be examined to determine if the requirements of §1.293 have been met. The application to which the request is directed will be examined to determine (1) if the subject matter of the application is appropriate for publication, (2) if the requirements for publication are met, and (3) if the requirements of 35 U.S.C. 112 and §1.293 of this part are met.

(b) Applicant will be notified of the results of the examination set forth in paragraph (a) of this section. If the requirements of §1.293 and this section are not met by the request filed, the notification to applicant will set a period of time within which to comply with the requirements in order to avoid abandonment of the application. If the application does not meet the requirements of 35 U.S.C. 112, the notification to applicant will include a rejection under the appropriate provisions of 35 U.S.C. 112. The periods for response established pursuant to this section are subject to the extension of time provisions of §1.136. After response by the applicant, the application will again be considered for publication of a statutory invention registration. If the requirements of §1.293 and this section are not timely met, the refusal to publish will be made final. If the requirements of 35

U.S.C. 112 are not met, the rejection pursuant to 35 U.S.C. 112 will be made final.

(c) If the examination pursuant to this section results in approval of the request for a statutory invention registration the applicant will be notified of the intent to publish a statutory invention registration.

23. A new section 1.295 is added to read as follows:

§1.295 Review of decision finally refusing to publish a statutory invention registration.

(a) Any requester who is dissatisfied with the final refusal to publish a statutory invention registration for reasons other than compliance with 35 U.S.C. 112 may obtain review of the refusal to publish the statutory invention registration by filing a petition to the Commissioner accompanied by the fee set forth in §1.17(h) within one month or such other time as is set in the decision refusing publication. Any such petition should comply with the requirements of §1.181(b). The petition may include a request that the petition fee be refunded if the final refusal to publish a statutory invention registration for reasons other than compliance with 35 U.S.C. 112 is determined to result from an error by the Patent and Trademark Office.

(b) Any requester who is dissatisfied with a decision finally rejecting claims pursuant to 35 U.S.C. 112 may obtain review of the decision by filing an appeal to the Board of Patent Appeals and Interferences pursuant to §1.191. If the decision rejecting claims pursuant to 35 U.S.C. 112 is reversed, the request for a statutory invention registration will be approved and the registration published if all of the other provisions of §1.293 and this section are met. [OMB Control No. 0651-0018].

24. A new section 1.296 is added to read as follows:

§1.296 Withdrawal of request for publication of statutory invention registration.

A request for a statutory invention registration, which has been filed, may be withdrawn prior to the date of the notice of the intent to publish a statutory invention registration issued pursuant to §1.294(c) by filing a request to withdraw the request for publication of a statutory invention registration. The request to withdraw may also include a request for a refund of any amount paid in excess of the application filing fee and a handling fee of $100 which will be retained. Any request to withdraw the request for publication of a statutory invention registration filed on or after the date of the notice of intent to publish issued pursuant to §1.294(c) must be in the form of a petition pursuant to §1.183 accompanied by the fee set forth in §1.17(h). [OMB Control No. 0651-0018].

25. A new section 1.297 is added to read as follows:

§1.297 Publication of statutory invention registration.

(a) If the request for a statutory invention registration is approved the statutory invention registration will be published. The statutory invention registration will be mailed to the requester at the correspondence address as provided for in §1.33(a). A notice of the publication of each statutory invention registration will be published in the *Official Gazette.*

(b) Each statutory invention registration published will include a statement relating to the attributes of a statutory invention registration. The statement will read as follows:

A statutory invention registration published pursuant to 35 U.S.C. 157 is not a patent but it has all of the attributes specified for patents in title 35, United States Code, except those specified in 35 U.S.C. 183 and sections 271 through 289. A statutory invention registration does not have any of the attributes specified for patents in any other provision of law other than title 35, United States Code. The invention with respect to which a statutory invention registration is published is not a patented invention for purposes of the marking provisions of 35 U.S.C. 292.

26. Section 1.301 is revised to read as follows:

§1.301 Appeal to U.S. Court of Appeals for the Federal Circuit.

Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (a) In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§1.302 and 1.304); and (b) in the Court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court. The certified list of documents and any original or certified copies of such documents required by the Court will be transmitted to the Court by the Patent and Trademark Office.

27. Section 1.302 is revised to read as follows:

§1.302 Notice of appeal.

(a) When an appeal is taken to the U.S. Court of Appeals for the Federal Circuit, the appellant shall give notice thereof to the Commissioner within the time specified in §1.304.

(b) In interferences, the notice must be served as provided in §1.646.

28. Section 1.304 is amended by revising paragraph (a) to read as follows:

§1.304 Time for appeal or civil action

(a) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is sixty days from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under §1.197(b) or §1.658(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. Except for an appeal from or commencing a civil action after a decision of the Board of Patent Appeals and Interferences in a reexamination proceeding or an interference proceeding, the time periods set forth herein are subject to the provisions of §1.136. See §1.550(c) for extensions of time to appeal or commence a civil action in a reexamination proceeding. See §1.645(a) for extensions of time to appeal or commence a civil action in an interference. An examiner-in-chief, upon a showing of excusable neglect, may extend the time for seeking judicial review of a decision of the Board of Patent Appeals and Interferences in an interference case when a request is untimely filed after expiration of the time prescribed by this section.

* * * * *

29. Section 1.378 is amended by revising the section heading and paragraph (a) to read as follows:

§1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable and if the surcharge required by §1.20(m) is paid as a condition of accepting payment of the maintenance fee.

If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the conditions set forth in 35 U.S.C. 41(c)(2).

* * * * *

30. Section 1.431 is amended by revising paragraphs (b)(3)(iii) and (c) and by adding new paragraphs (d) and (e) to read as follows:

§1.431 International application requirements.

* * * * *

(b)(3) * * *

(iii) The name of the applicant, as prescribed (note §§1.421-1.424);

(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fees (§1.445) may be made in full at the time international application papers required by paragraph (b) of this section are deposited or within one month thereafter. Failure to make full payment within one month of the deposit of the international application papers required by paragraph (b) of this section will result in the fees being charged to the International Bureau under the provisions of paragraph (d) of this section and PCT Rule 16 bis.

(d) The United States Receiving Office will charge to the International Bureau in accordance with PCT Rule 16 bis and will consider as having been timely paid:

(1) the transmittal fee, the basic fee portion of the international fee, or the search fee where these fees have not been fully paid by the applicant within one month of the date of deposit of the international application, and

(2) the destination fee, or the amount necessary to cover all the designations made in the request which have not been paid by the applicant within one year from the priority date.

(e) The International Bureau will notify applicant of any amount charged under paragraph (d) of this section and invite the applicant to pay directly to the International Bureau within one month from the date of the notification, the amount charged, augmented by a surcharge of 50%, provided the surcharge will not be less and will not be more, than the amounts indicated in the Schedule of Fees appended to the PCT Rules. If the payment needed to cover the transmittal fees, the basic fee, the search fee, one designation fee and the surcharge is not timely made to the International Bureau, the International Bureau will notify the Receiving Office which will declare the international application withdrawn under PCT Article 14(3)(a). If the applicant makes timely payment of the fees referred to in the previous sentence, but the amount paid is not sufficient to cover all the designation fees, the Receiving Office will declare any designations not paid withdrawn under PCT Article 14(3)(b) in accordance with PCT Rule 16 bis. 2(c).

31. Section 1.445 is amended by revising paragraphs (a)(4) and (5) and adding paragraph (a)(6) to read as follows:

§1.445 International application filing and processing fees.

(a) * * *

(4) The national fee, that is, the amount set forth as the filing fee under §1.16(a) through (d) credited one time only by an amount of $250 where an international search fee of $500.00 has been paid on the corresponding international application to the United States Patent and Trademark Office as an International Searching Authority. Where the amount of the credit is in excess of that required for the national fee, a request for a refund of the excess under §1.446(b) may be filed at the time of paying the national fee. Only one such credit is permitted based on a single $500.00 international search fee.

(5) Surcharge for filing the national fee or oath or declaration later than 20 months from the priority date $100.00

(6) For filing an English translation of an international application later than 20 months after the priority date (§1.61(b)).. $20.00

* * * * *

32. Section 1.446 is amended by revising the section heading and paragraph (b) to read as follows:

§1.446 Refund of international application filing and processing fees.

* * * * *

(b) Refund of a portion of the search fee toward payment of the national fee may be made one time to the extent set forth in §1.445(a)(4) if requested at the time of paying the national fee provided that a $500 search fee has been paid.

* * * * *

33. Section 1.451 is amended by revising paragraphs (b) and (c) to read as follows:

§1.451 The priority claim and priority document in an international application.

* * * * *

(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office or in a separate letter filed in the Receiving Office not later than 16 months after the priority date, that the Patent and Trademark Office prepare a certified copy of the national application for transmittal to the International Bureau (PCT Article 8 and PCT Rule 17). The fee for preparing a certified copy is stated in §1.19(a)(3) and (b)(1).

(c) If a certified copy of the priority document is not submitted together with the international application on filing, or, if the priority application was filed in the United States and a request and appropriate payment for preparation of such a certified copy do not accompany the international application on filing or are not filed within 16 months of the priority date, the certified copy of the priority document must be furnished by the applicant to the International Bureau or to the United States Receiving Office within the time limit specified in PCT Rule 17.1(a).

34. Section 1.461 is amended by deleting paragraph (b) and by revising paragraph (a) to read as follows:

§1.461 Procedures for transmittal of record copy to the International Bureau.

(a) Transmittal of the record copy of the international application to the International Bureau shall be made by the United States Receiving Office.

(b) (reserved)

* * * * *

Feb. 14, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 2, 1985

Re. 31,235	4,438,029	4,461,446	4,472,451
Re. 31,502	4,438,577	4,461,669	4,472,485
D. 271,404	4,439,561	4,461,757	4,472,704
D. 276,441	4,439,616	4,462,860	4,472,853
3,748,225	4,439,959	4,462,910	4,473,051
3,963,986	4,440,597	4,463,337	4,473,058
4,281,391	4,440,921	4,464,238	4,473,210
4,327,271	4,440,937	4,464,292	4,473,321
4,336,589	4,440,958	4,464,373	4,473,738
4,342,756	4,441,952	4,464,397	4,473,864
4,352,726	4,442,402	4,464,754	4,473,894
4,358,374	4,443,449	4,464,882	4,474,653
4,358,814	4,444,673	4,465,203	4,474,704
4,363,472	4,445,168	4,465,895	4,474,923
4,370,255	4,447,368	4,466,108	4,475,385
4,370,452	4,447,435	4,466,242	4,475,440
4,371,240	4,448,671	4,466,522	4,475,802
4,386,493	4,450,081	4,467,146	4,476,468
4,390,661	4,450,155	4,467,673	4,477,420
4,394,769	4,451,149	4,467,998	4,477,687
4,395,417	4,453,092	4,468,500	4,477,698
4,399,474	4,453,595	4,468,588	4,478,043
4,400,585	4,453,637	4,469,499	4,478,998
4,401,427	4,453,902	4,469,668	4,479,164
4,404,414	4,454,103	4,469,682	4,479,189
4,404,730	4,454,463	4,469,728	4,479,197
4,404,872	4,455,556	4,470,143	4,479,755
4,409,996	4,456,185	4,470,171	4,479,932
4,410,265	4,456,485	4,470,252	4,480,407
4,413,153	4,456,513	4,470,359	4,480,497
4,415,498	4,456,532	4,470,683	4,480,710
4,415,558	4,456,616	4,471,015	4,480,740
4,416,288	4,456,688	4,471,095	4,480,771
4,421,796	4,456,700	4,471,146	4,480,977
4,423,528	4,457,235	4,471,170	4,481,020
4,424,909	4,457,289	4,471,192	4,481,193
4,425,371	4,458,035	4,471,445	4,481,446
4,425,442	4,458,291	4,471,483	4,481,602
4,426,852	4,458,589	4,471,492	4,482,696
4,428,806	4,458,712	4,471,649	4,483,422
4,429,106	4,460,308	4,471,654	4,483,674
4,429,934	4,460,645	4,471,800	4,483,677
4,430,723	4,460,745	4,472,153	4,484,268
4,437,379	4,460,778	4,472,356	4,485,123

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4277
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 2, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-25-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-05-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	8-01-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	9-30-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	3-07-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	7-19-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	10-25-68
DESIGN, GROUP 290—K. L. CAGE, Director	9-17-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	4-17-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	3-19-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-29-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	12-21-81
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-15-82

Expiration of patents: The patents within the range of numbers indicated below expire during February 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,366,970 to 3,371,350, inclusive

Plant Patents ..... Numbers 2,784 to 2,793 inclusive

REEXAMINATIONS

APRIL 2, 1985

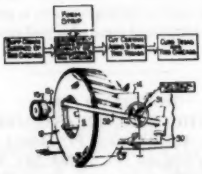
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,472,714 (326th)

METHOD OF REBUILDING PREVIOUSLY USED TIRES

Bradley E. Ragan, Spruce Pine, N.C., assignor to Brad Ragan Inc., Spruce Pine, N.C.

Reexamination Request No. 90/000,507, Feb. 22, 1984.
Reexamination Certificate for Patent No. 3,472,714, issued Oct. 14, 1969, Ser. No. 587,599, Oct. 18, 1966.
Filed Feb. 22, 1984, Ser. No. 587,599
Int. Cl.³ B29H *17/40, 17/36*
U.S. Cl. 156—96



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** is confirmed.

1. A method of rebuilding a previously used heavy-duty pneumatic tire comprising the steps of:

forming a smooth surface on the periphery of a previously used tire carcass,

supplying uncured rubber stock in an indeterminate length, uniform thickness strip having a generally rectangular cross-sectional configuration and predetermined width substantially greater than the thickness thereof and substantially equal to the width of the peripheral surface of the tire carcass, then

severing from the stock strip and winding about the smoothed peripheral surface a plurality of convolutions of the uncured rubber stock while stitching and adhering the convolutions together and to the tire carcass, then

passing a heated tool through some of the adhered together convolutions and removing therefrom circumferentially spaced apart, transversely extending portions while maintaining the innermost convolution immediately adjacent and directly adhered to the peripheral surface of the tire carcass unsevered so as to define on the tire carcass a lugged tread in which lugs projecting radially outwardly at and extending transversely across the periphery of the rebuilt tire are formed by adhered together sector portions of the convolutions through which the heated tool passed and so as to retain adhesion of the sector portions and innermost convolution to the tire carcass and each other, and then

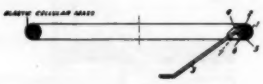
curing the rubber stock by heating the entire rebuilt tire.

B1 3,523,464 (327th)

STEERING WHEEL WITH PLASTIC FOAM SHEATHING

Henri P. M. Quillery, La Garenne-Colombes, France and Georges Gonzalez, 10 rue de Bellechasse, Paris, France, assignor to Societe Quillery, La Garenne-Colombes, France; part interest

Reexamination Request No. 90/000,448, Sep. 22, 1983.
Reexamination Certificate for Patent No. 3,523,464, issued Aug. 11, 1970, Ser. No. 632,233, Apr. 20, 1967.
Continuation-in-part of Ser. No. 619,189, Feb. 28, 1967, which is a continuation-in-part of Ser. No. 473,838, Jul. 21, 1965.
Claims priority, application France, Apr. 26, 1966, 59.079
Int. Cl.³ B62D *1/04*
U.S. Cl. 74—552



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** and **2** is confirmed.

Claim **3** is cancelled.

1. A steering wheel having a rim core, a hub, and arms at least said rim core being covered at least to a partial extent with a sheath which constitutes the external gripping surface of the rim, said sheath comprising at the surface a substantially non-expanded elastomer layer which is both compact and impervious and, internally, a flexible and elastic cellular mass forming a protective padding which provides isolation against shocks and vibrations, said mass being secured to said layer,

and said steering wheel being further characterized in that said rim sheath is provided with appendages which extend to the arms extremities of the steering-wheel core and cover said extremities,

said appendages of the rim sheath are covered by the extremities of the removable arm-sheath.

B1 4,167,585 (328th)

METHOD FOR HEATING AND COOKING FOODS IN A CLOSED TREATMENT CHAMBER BY MAINTAINING THE TEMPERATURE AND MOISTURE CONTENT

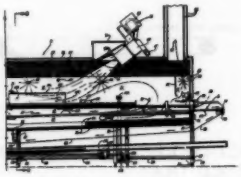
Andrew A. Caridis, Foster City, and Clark K. Benson, Millbrae, both of Calif., assignors to Heat and Control, Inc., San Francisco, Calif.

Reexamination Request No. 90/000,545, Apr. 18, 1984.
Reexamination Certificate for Patent No. 4,167,585, issued Sep. 11, 1979, Ser. No. 853,503, Nov. 21, 1977.
Continuation of Ser. No. 662,512, Mar. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 544,393, Jan. 27, 1975, Pat. No. 3,947,241, which is a continuation of Ser. No. 328,925, Feb. 2, 1973, abandoned.
Int. Cl.³ A22C *17/00, 25/00;* **F27B** *9/00, 9/14*
U.S. Cl. 426—233

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–13** is confirmed.

1. In a rapid continuous process for heating and cooking foods, the steps of forming a treating zone within a substantially closed treatmment chamber, said chamber having inlet and outlet openings, introducing food to said chamber in the form of solid discrete pieces, said food moving through said chamber along a pathway extending through said inlet opening and said treating zone and exiting through said outlet opening, generating a gaseous process vapor within said treatment chamber and rapidly and continuously circulating the same along the pathway in said treating zone in a direction concurrent to the direction of movement of said food, heating said rapidly circulating process vapor to continuously maintain the temperature thereof within the range from 165° to 600° F., the temperature of said rapidly circulating process vapor bearing a relationship to the entering food such that a substantial temperature differential exists between the food and process vapor ranging to as much as 295° to 560° F., said food being moved in a concurrent direction with said rapidly circulating process vapor at a rate and for a distance to effect heating and cooking



thereof for a period of time sufficient to raise the center temperature of said discrete pieces of food to within the range from 140° to 195° F., intermittently releasing saturated steam into said rapidly circulating and heated process vapor to raise the moisture content thereof continuously removing external air from adjacent the inlet and outlet openings of said treatment chamber to thereby substantially prevent the entry of external air to said treating zone, such exclusion of air serving to limit the proportion of air within the process vapor continuously and rapidly circulating within said treatment chamber and through said treating zone, continuously monitoring the moisture content of said rapidly circulating process vapor to determine variations in the moisture content and continuously using the variations in moisture content so determined to control said intermittent release of saturated steam to the process vapor being rapidly circulated within said treatment chamber, thereby to provide a rapidly and continuously circulating process vapor of controlled temperature and moisture content as needed and desired for heating and cooking particular foods undergoing treatment.

B1 4,190,801 (329th)

DIGITAL ENCODING CIRCUITRY

Richard E. DeFreitas, Westford, Mass., assignor to DeltaLab Research, Inc., Chelmsford, Mass.

Reexamination Request No. 90/000,604, Aug. 8, 1984.
Reexamination Certificate for Patent No. 4,190,801, issued Feb. 26, 1980, Ser. No. 875,336, Feb. 6, 1978.
Int. Cl.³ H03K *13/22;* **H04B** *12/04*
U.S. Cl. 375—30

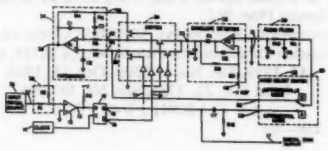
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–24** is confirmed.

23. In an electrical system of the type in which a digitally encoded signal is determined at least in part by the difference between a present value of an input signal and a reference signal representative of a past value of said input signal, improved circuitry for generating said reference signal, comprising

extraction means including a filter for extracting from the pattern of bits in said digitally encoded signal information relating to the time derivative of said present value to provide a corresponding control signal, and

integrating means responsive to said control signal to provide said reference signal, wherein



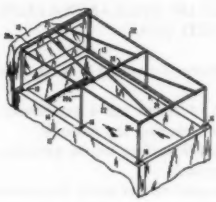
said integrating means comprises integrating circuitry to provide said reference signal, said integrating circuitry having positive and negative slope control inputs controlling the direction and rate of change of said reference signal, and switching means is provided for selectively providing said control signal to said slope control inputs.

B1 4,272,119 (330th)

VEHICLE COVER ASSEMBLY

Robert M. Adams, 41241 Orange Pl., Hemet, Calif. 92343

Reexamination Request No. 90/000,559, May 18, 1984.
Reexamination Certificate for Patent No. 4,272,119, issued Jun. 9, 1981, Ser. No. 912,070, Jun. 5, 1978.
Continuation-in-part of Ser. No. 665,654, Mar. 10, 1976, Pat. No. 4,093,302, which is a continuation-in-part of Ser. No. 654,623, Feb. 2, 1976, abandoned. This application May 18, 1984, Ser. No. 912,070
Int. Cl.³ B60P *3/34*
U.S. Cl. 296—100



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–27** is confirmed.

23. A vehicle cargo area comprising upstanding sidewalls forming a cargo area;

a unitary cover member formed of flexible sheet material having a front edge, a rear edge, and two side edges adapted to fit over respective sidewalls of said cargo area;

means for securing the respective side edges of said cover member to said respective sidewalls of the cargo area of the vehicle to hold said side edges to said sidewalls with the cover being tautly held therebetween; and

each of said means for securing said side edges including a separable fastener of the hook and loop type having a first part with a plurality of upstanding hook or loop type members extending therefrom and a complementary part having a plurality of complementary upstanding hook or loop type members extending therefrom for interengagement with the upstanding members of said first part along

a plane of interengagement, said first part being disengageable from said complementary part when peeled away to effect pulling of hook and loop type members substantially perpendicularly to the plane of interengagement and said first part resisting disengagement when subjected to forces parallel to the plane of interengagement, said first part being secured to said cover member adjacent to a said side edge and said complementary part being secured to a said sidewall of the cargo area for releasable engagement with said first part and said first part of said separable fastener being located relative to the side edge of said cover member for maintaining said cover member in a taut disposition over said cargo area whereby said first member is releasably secured to said complementary part by pressing said first part into engagement with said complementary part to effect interengagement of upstanding members and prevent inadvertent disengagement of said first part and said complementary part.

B1 4,289,903 (331st)

PARA-PHENYLALKOXY PHENYLUREA AND THIOUREA COMPOUNDS AND HERBICIDAL USE THEREOF

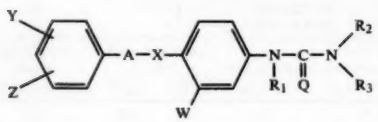
David M. Spatz, Trenton, and Barrington Cross, Rocky Hill, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Reexamination Request No. 90/000,474, Nov. 30, 1983.
Reexamination Certificate for Patent No. 4,289,903, issued Sep. 15, 1981, Ser. No. 51,584, Jun. 25, 1979,
Int. Cl.[3] **C07C** *127/15, 127/17;* **A01N** *7/00, 17/08*
U.S. Cl. 564—20

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–18** are cancelled.

[**1**. A compound of the formula:



wherein X is selected from the group consisting of O,S, and SO_2; Q is O; R_1 is H or CHO; R_2 is H or C_1–C_4 alkyl; W is selected from the group consisting of H, halogen, C_1–C_4 alkyl, CF_3, OCH_3, and NO_2; R_3 is selected from the group consisting of H, C_1–C_4 alkyl, C_1–C_4 alkyl monosubstituted with either C_1–C_3 alkoxy or halogen, C_3–C_5 alkenyl, C_3–C_5 alkynyl and CHO; A represents C_2–C_3 alkyl; Y is selected from the group consisting of H, halogen, C_1–C_4 alkyl, OCH_3 and CF_3; Z represents H, halogen, C_1–C_4 alkoxy.]

B1 4,313,448 (332nd)

MYOCARDIAL SUTURELESS LEAD

Kenneth B. Stokes, Brooklyn Park, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Reexamination Request No. 90/000,568, Jun. 6, 1984.
Reexamination Certificate for Patent No. 4,313,448, issued Feb. 2, 1982, Ser. No. 115,966, Jan. 28, 1980.
Int. Cl.[3] **A61N** *1/04*
U.S. Cl. 128—785

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

Claims **8** and **9** are cancelled.

New claims **10–12** are added and determined to be patentable.

1. A body implantable lead comprising:
a conductor having a distal end;
an insulating sheath covering said conductor; means attached to said conductor near said distal end for affixing said body implantable lead to body tissue; and
flexible base means attached to said conductor near said distal end which in a relaxed state is disposed over said fixation means from at least one direction and which upon application of a small amount of force may be bent back exposing said fixation means from said at least one direction.

B1 4,357,256 (333rd)

SODIUM HYDROSULFITE COMPOSITION

Takaaki Yamaguchi, Tokyo, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Reexamination Request No. 90/000,547, Apr. 20, 1984.
Reexamination Certificate for Patent No. 4,357,256, issued Nov. 2, 1982, Ser. No. 128,098, Mar. 7, 1980.
Claims priority, application Japan, Mar. 13, 1979, 54-29186
Int. Cl.[3] **C09K** *3/00*
U.S. Cl. 252—188.24

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–6** are cancelled.

[**1**. A bleaching sodium hydrosulfite composition which minimizes H_2S generation in use and which comprises sodium hydrosulfite, 3 to 15% by weight of hexamethylenetetramine and 5 to 15% by weight of a water-soluble sulfite selected from the group consisting of sodium sulfite, ammonium sulfite and potassium sulfite.]

DEFENSIVE PUBLICATIONS

PUBLISHED APRIL 2, 1985

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T105,301
PROCESS FOR THE PRODUCTION OF SOLID UREA-NITRIC PHOSPHATE FERTILIZER PRODUCTS

Jack M. Sullivan, 106 Patsy Dr.; Yong K. Kim, 230 Roxie Dr., both of Florence, Ala. 35630, and Kjell R. Waerstad, Rte. 3, Colbert Heights, Tuscumbia, Ala. 35674

Filed May 21, 1984, Ser. No. 612,162
Int. Cl.[3] C05C *9/00*; C05B *11/06*
U.S. Cl. 71—39
1 Sheets Drawing. 42 Pages Specification

The present invention relates to the reaction of phosphate rock with nitric acid and urea to produce nitrogen-phosphorus containing slurries, which slurries may be granulated and dried to produce solid N-P fertilizer products with agronomically advantageous low pHs (1.1-4.0). Products with optimum physical and chemical properties were discovered by investigating the characteristics of each individual material as a function of the nitric acid acidulation ratio (mole ratio HNO_3:CaO) and the mole ratio urea:CaO present in each product. Acidulation ratios ranged from 1.2 to 2.1 while ratios urea:CaO ranged from 1.6 to 4.0. Selected products with optimum physicochemical properties are tabulated below:

Acidulation Ratio HNO_3:CaO, M/M	Ratio Urea:CaO, M/M	Grade	Melting Pt, °C.
1.2	2.2	23.8—11.7—0	137–139
1.4	2.4	25.0—11.0—0	136
1.6	2.8	25.9—9.9—0	133–137
1.8	3.0	26.4—9.2—0	134–135
2.0	3.3	27.2—8.7—0	130
2.1	3.2	36.6—8.8—0	125–130

Acidulation Ratio	P_2O_5 Solubility, %		pH of 1%	Critical Relative Humidity
HNO_3:CaO, M/M	Water	Citrate	solution	at 25° C., %
1.2	69.2	82.1	2.5	59.3
1.4	81.8	90.0	2.4	60.9
1.6	88.9	91.9	2.3	60.1
1.8	96.7	98.9	2.1	59.9
2.1	99.0	100	2.1	60.0

-continued

2.1	100	100	2.1	59.5

The products have excellent storage characteristics. The improved properties of these products result partially from the formation of a new compound

$$Ca(H_2PO_4)(NO_3),\ CO(NH_2)_2,$$

which was discovered during the course of the investigation that led to the instant invention.

T105,302
TAMPER-RESISTANT CONTAINER

Joseph E. Hoffman, Jr., P.O. Box 300, Morrisville, N.C. 27560

Continuation of Ser. No. 477,996, Mar. 23, 1983, abandoned.
This application May 16, 1984, Ser. No. 611,375
Int. Cl.[3] B65D *85/56, 83/04, 81/20, 17/32*
U.S. Cl. 206—524.8
1 Sheets Drawing. 10 Pages Specification

A tamper-resistant container containing a pharmaceutical preparation, wherein the container is a removable full-panel easy-open metal top end closure having an opening tab for irreversibly removing said end closure, whereby once the end closure is opened, that fact will be readily ascertainable from the appearance of the container.

REISSUES

APRIL 2, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

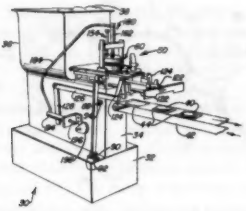
Re. 31,857
METHOD FOR MAKING FOOD PATTY

Harry H. Holly, Boca Raton, Fla., assignor to Holly Systems, Inc.,.Boca Raton, Fla.

Original No. 4,272,864, dated Jun. 16, 1981, Ser. No. 25,031, Mar. 29, 1979. Application for reissue Jun. 15, 1983, Ser. No. 504,661

Int. Cl.[3] **A22C** *7/00*

U.S. Cl. 17—45 **22 Claims**



16. A process for making a patty of plastic food material containing tissue fibers by the steps of forcing said plastic food material from a bulk supply of said food material into a mold cavity under pressure and then removing the formed patty from the mold cavity, said method characterized by the following steps:

(a) providing a foraminous member having an array of apertures for use in said process;

(b) forcing said food material from said bulk supply under pressure to a location adjacent said foraminous member;

(c) providing mold parts to define said mold cavity and disposing said mold parts directly adjacent said foraminous member with a mold opening at the interface of said foraminous member and said mold cavity for permitting passage of said food material from said foraminous member directly into said mold cavity in the absence of mixing instrumentalities at said interface;

(d) forcing said food material at least into said foraminous member apertures and then out of said apertures as discrete extrudate masses into said mold cavity with at least some of said extrudate masses being forced against said mold parts of said mold cavity until said mold cavity is substantially filled with said extrudate masses to form said patty completely surrounded by said mold parts except for said mold opening adjacent said foraminous member;

(e) before, during, or after step (d), effecting multidirectional movement of said food material at the apertures in said foraminous member to prevent clogging of said apertures with tissue fibers;

(f) moving said mold parts together and/or relative to each other to permit access to said formed patty; and

(g) removing said formed patty from said moved mold parts.

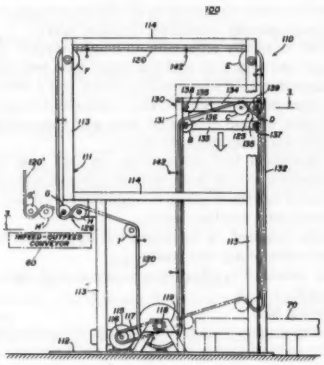
Re. 31,858
CONTINUOUS CHAIN STACKER/UNSTACKER

Maynard R. Euverard, Williamsburg, Va.; Henry A. Heide, Addison, and James J. Diver, South Holland, both of Ill., assignors to Velten & Pulver, Inc., Chicago Ridge, Ill.

Original No. 4,303,365, dated Dec. 1, 1981, Ser. No. 839,456, Oct. 5, 1977. Application for reissue Jun. 7, 1982, Ser. No. 385,851

Int. Cl.[3] **B65G** *57/02, 59/02*

U.S. Cl. 414—37 **22 Claims**



15. A machine for moving articles to and from a support at an operation location, said machine comprising a continuous conveyor for conveying articles to the operation location and away from the operation location, said conveyor comprising two laterally spaced-apart parallel endless conveyor members each having a pivot fixed thereon for movement therewith, said conveyor members being respectively movable along parallel paths including transfer portions respectively defining arcs of equal parallel circles, the axes of said pivots being spaced apart and parallel so as to define a plane which remains in a predetermined fixed orientation with respect to the horizontal and the vertical as said conveyor members move along the paths, said axes being parallel to the axes of said circles and respectively spaced from said conveyor member paths a distance equal to the radii of said circles in directions so as to be respectively coaxial with said circles when the adjacent parts of said conveyor members are in said transfer portions of said paths, and a rigid article carrier supported solely by and interconnecting said conveyor members for pivotal movement only with respect to the pivot axes, said carrier including support means for supporting an associated article thereon beneath said plane, said transfer portions of said conveyor member paths being disposed adjacent to the operation location and said paths being arranged so that as the parts of said conveyor members adjacent to said carrier move to, through and from said transfer portions of said paths said carrier and any article supported thereby are conveyed to the support at the operation location, remain stationary in a transfer position at the operation location and are conveyed from the support while being prevented from passing through the support, said conveyor member paths being arranged so that the portion of said plane between said pivot axes does not intersect the associated support, and means for effecting transfer of the associated article from said carrier to the associated support or from the associated support to said carrier when said carrier is in the transfer position, whereby said carrier is stably held in a fixed position with respect to said plane for only translational movement with respect to said conveyor members along the paths.

Re. 31,859

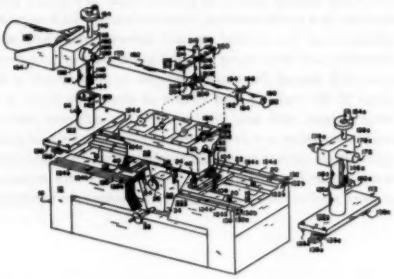
ALIGN BORING MACHINE

R. Warren Aldridge, Jr., Huntsville, Ala., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Original No. 4,213,721, dated Jul. 22, 1980, Ser. No. 972,975, Dec. 26, 1978. Continuation-in-part of Ser. No. 875,985, Feb. 8, 1978, Pat. No. 4,132,494. Application for reissue Jun. 1, 1982, Ser. No. 383,931

Int. Cl.³ B23B *41/12*

U.S. Cl. 408—54 **9 Claims**



1. A boring machine for alignment boring of a plurality of bearing housings of an automotive engine block comprising:

a horizontally elongated base having vertical and horizontal longitudinally extending machine ways;

a first vertically adjustable-in-height support positioned on one end region of said elongated base and engageable and alignable with said machine ways, and a second vertically adjustable-in-height support positioned on an opposite end region of said elongated base and engageable and alignable with said machine ways;

an elongated horizontal track on said base between said supports, which track defines a longitudinal axis and horizontal reference plane in alignment with said vertical and horizontal machine ways;

a table adapted to be supported by and be longitudinally movable along said track,

feed means for selectively moving said table along said track;

a boring bar;

bearing support means for horizontally and rotably supporting ends of said boring bar on and between said first and second supports and along a line in a first plane parallel with the plane of said vertical machine ways and coincident in a second plane parallel with the plane of said horizontal machine ways;

drive means coupled to one end of said boring bar for rotating said boring bar;

engine block support means for rigidly supporting an engine block on said table with said boring bar through bearing housings with said bar concentrically positioned with respect to the center of a desired bore through said bearing housings; and

at least one cutting tool mounted on said boring bar, whereby bearing housings of an engine block may be bored by moving said table longitudinally by operation of said feed means.

Re. 31,860

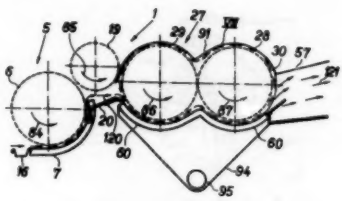
HARVESTING MACHINES

Frans J. G. C. Decoene, Zedelgem, and Cornelis G. M. Muijs, Sint-Kruis Brugge, both of Belgium, assignors to Sperry Corporation, New Holland, Pa.

Original No. 3,946,746, dated Mar. 30, 1976, Ser. No. 482,929, Jun. 25, 1974. Application for reissue Sep. 30, 1982, Ser. No. 432,165

Int. Cl.³ A01F *12/20, 12/44*

U.S. Cl. 130—27 P **9 Claims**



4. An agricultural harvesting machine comprising:

a. a frame adapted to travel across a field,

b. means for conveying crop material from the field to the frame,

c. means transversely mounted to said frame rearwardly of the conveying means for threshing grain from the crop material,

d. a separator casing mounted to said frame rearwardly of the threshing means and disposed substantially parallel thereto for receiving said crop material from the threshing means over a width substantially corresponding to the width of the threshing means, the casing having ends extending over substantially equal distances laterally beyond the respective ends of said threshing means and comprising concaves mounted to said frame to enable separated grain to pass therethrough, said casing further including a forwardly facing opening having a width substantially corresponding to the width of the threshing means and adapted to receive crop material from said threshing means, said casing also including rearwardly facing discharge openings positioned at either end of said casing and tranversely offset relative to the infeed opening for discharging crop material from said casing, and

e. means rotatably mounted within said casing and operably associated therewith to spirally convey crop material laterally in layers of substantially half the width of the threshing means towards each of its ends while submitting said layers of material to a separating action *the rotatably mounted means comprising two transversely extending rotors having crop treating and crop conveying elements, the rotors being arranged in parallel relationship and driven in the same direction.*

PLANT PATENTS

GRANTED APRIL 2, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,424

MINIATURE ROSE PLANT

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Aug. 22, 1983, Ser. No. 525,454
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant named 'POPS' of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by its abundance of deep pink blooms of exhibition quality, usually borne singly or in sprays of 3 to 5 or more, which may be propagated from cuttings, and grows well outdoors or in the green house.

5,425

ROSE PLANT

Shafner R. Rodgers, Dallas, Tex., assignor to Neiman-Marcus Company, Dallas, Tex.

Filed Jun. 20, 1983, Ser. No. 505,802
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by a very vigorous plant with abundant, glossy, dark green foliage producing many large, cup-shaped pink blend flowers one to a stem on substantial stems.

5,426

ROSE PLANT 'MACHADEN'

Samuel D. McGredy, 130 B Beach Rd., Castor Bay, Auckland 9, New Zealand

Filed Jul. 28, 1983, Ser. No. 518,088
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—21 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by relatively large, heavily petaled currant red flowers borne one to a stem on a vigorous, tall growing plant.

5,427

ROSE PLANT 'DACSHANA'

Samuel D. McGredy, 130 B Beach Rd., Castor Bay, Auckland 9, New Zealand

Filed Jul. 28, 1983, Ser. No. 518,092
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by small clusters of lemon yellow flowers larger than average for miniatures, upright growing and quick repeating flower habit ideal for pot forcing.

5,428

ROSE PLANT 'MACNEWYE'

Samuel D. McGredy, 130 B Beach Rd., Castor Bay, Auckland 9, New Zealand

Filed Jul. 28, 1983, Ser. No. 518,093
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as shown and described, characterized particularly by unusual Spanish orange flowers borne singly and in small clusters beautifully contrasting with deep green foliage.

5,429

ROSE PLANT 'MACWAIKE'

Samuel D. McGredy, 130 B Beach Rd., Castor Bay, Auckland 9, New Zealand

Filed Jul. 28, 1983, Ser. No. 518,100
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—26 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as shown and described, characterized particularly by excellent floribunda inflorescence with laterals all comparable, flowers of unusual azalea pink and orient pink coloring, vigorous plant of excellent disease resistance, and quick repeating flowering habit.

PATENTS

GRANTED APR. 2, 1985

ERRATA

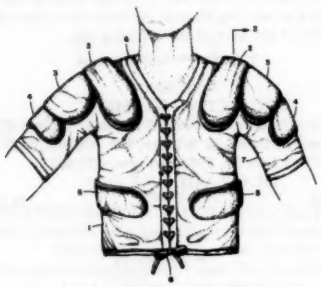
For CLASS	See PATENT NO.
128–673	4,508,103
108–009	4,508,305
384–510	4,508,397
514–019	4,508,710
514–011	4,508,711
514–011	4,508,712
514–060	4,508,713
514–280	4,508.715
514–220	4,508,716
514–203	4,508,717
514–236	4,508,719
514–247	4,508,720
514–252	4,508,721
514–353	4,508,722
514–195	4,508,723
514–317	4,508,724
514–362	4,508,725
514–220	4,508,726
514–398	4,508,727
514–400	4,508,728
514–419	4,508,729
514–218	4,508,730
514–472	4,508,731
514–466	4,508,732
514–578	4,508,733
514–594	4,508,734
514–616	4,508,735
252–301.21	4,508,784
260–544 D	4,508,857
548–156	4,508,903
378–101	4,509,175

PATENTS

GRANTED APRIL 2, 1985

GENERAL AND MECHANICAL

4,507,801
PROTECTIVE GARMENT
Frank J. Kavanagh; James D. Plunkett, and Bernard F. DePalma, all of Ithaca, N.Y., assignors to Doc-K Protective Equipment, Inc., Ithaca, N.Y.
Filed Sep. 7, 1982, Ser. No. 415,678
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **9 Claims**



1. A protective garment for protecting at least the upper part of the body of an athlete comprising:

a. tightly fitting body-covering means made of stretchable material;

b. plurality of pockets affixed to the body covering means;

c. said pockets being located in the portion of the body-means covering the body portion to be protected;

d. a plurality of impact-absorbing pad means for protecting a body portion adapted to fit in the pocket means covering the body portion to be protected;

e. each pad means being shaped to conform to the contours of the wearer's body at the portion to be protected, whereby the pad means, fitting into the pocket means, protects a portion of the body by closely conforming to the body, held accurately in place by stretching of body covering means;

f. the garment having pocket means and pad means for insertion therein to cover and protect at least the acromio-clavicular joint of the shoulder;

g. said pocket means and pad means protecting the said acromio-clavicular joint of the shoulder extending downward to the wearer's pectoral and upper trapezius muscles, such that the pad means is bridged over the acromio-clavicular joint of the shoulder, leaving a gap between the top of the wearer's shoulder and the pad means, whereby impact forces are transferred to the pectoral and trapezius muscles, while allowing free movement of the shoulder.

4,507,802
ADAPTIVE BALLISTIC PANEL CARRYING GARMENT
Irvin L. Small, Nashville, Tenn., assignor to Horace Small Manufacturing Company, Nashville, Tenn.
Filed May 3, 1983, Ser. No. 491,077
Int. Cl.³ F41H *1/02*
U.S. Cl. 2—2.5 **6 Claims**

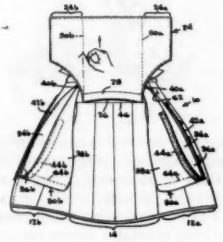
1. A ballistic panel carrier garment adaptive to receive ballistic panels of varying configurations and sizes corresponding to the size of the garment's wearer, said garment comprising:

(a) a front portion and a back portion;

(b) a back pocket-like receptacle having an opening for receiving a back ballistic panel, said back receptacle being attached to said back portion;

(c) a front pocket-like receptacle having an opening for receiving a front ballistic panel, said front receptacle being attached to said front portion; and

(d) each of said front and back receptacles being of a configuration and of a size closely matching the configuration and size of its corresponding ballistic panel to insure that the front and back ballistic panels are supported accurately without shifting to protect the vital parts of the garment's wearer, wherein the improvement comprises at least one of said front and back receptacles comprising means for adapting said one receptacle to receive in a first mode a ballistic panel of a first configuration and in a second mode for receiving a ballistic panel of a second, different configuration.



4,507,803
RIDING MITTENS
Harriet E. Ryan, and Linda A. Ryan, both of 20803 Behrendt, Warren, Mich. 48091
Filed May 19, 1983, Ser. No. 495,975
Int. Cl.³ A41D *13/08*
U.S. Cl. 2—16 **3 Claims**

1. A riding mitten manufactured of a material condusive to providing warmth, comprised of a cuff section and an adjoining body section having a thumb pocket, inset on the palmside, a second pocket for the index, middle and ring fingers, and a third pocket for the little finger, positioned midway up the bodyside opposite the thumb, extending independently parallel to said second pocket with which it mutually employs a seamless, deep inner crotch, all said pockets being tapered to an oval and closed at their ends leaving one opening at the end of the cuff section for said mitten to be drawn on and off the hand, and reinforcement material stitched onto the palmside of said second pocket, said reinforcement material extending from a point below the fingertips, down to a point below the base of the fingers, and curling around both sides of said second pocket to a point extending partially onto the backhand side of said second pocket.

4,507,804

FINGER-GUARD

Claude Consigny, 4160 - 3rd Ave. - Apartment 16, Charlesbourg, Quebec G1H 6E1, Canada

Filed Nov. 28, 1983, Ser. No. 555,598
Int. Cl.³ A41D *13/08*
U.S. Cl. 2—21 **4 Claims**

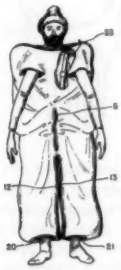
1. A finger-guard for protection against injuries by a knife or the like tool, comprising: two resilient stems adapted to extend along opposite sides of an operator finger, a multiplicity of spaced-apart, elongated lamellae, each longitudinally curved into about half a circle, extending transversely of said stems and having their ends pivotally connected to the two stems, said lamellae adapted to extend along the back hand face of the operator finger with a given upper lamella having a lower portion overlying the upper portion of the corresponding lower lamella, whereby should the blade of a knife hit the lamellae, the blade will slide downwardly successively from upper to lower lamellae in a smooth fashion, said stems longitudinally curved, and, when in non-stressed condition, applying said lamellae against a bent operator finger, said stems being straighthened out by said lamellae when said finger is unbent, and strap means attached to said stems at an intermediate portion thereof and extending from said stems in a direction opposite said lamellae to surround the front hand face of the finger and to retain said lamellae and stems on said finger.

4,507,805

AMBULATORY SLEEPING BAG

Nicolae I. Calutoiu, 1923 N. Carmen Ave., Los Angeles, Calif. 90068

Continuation-in-part of Ser. No. 521,593, Aug. 9, 1983, abandoned. This application Dec. 15, 1983, Ser. No. 562,034
Int. Cl.³ A41D *15/04*
U.S. Cl. 2—69.5 **5 Claims**



1. A convertible sleeping bag for use as a sleeping bag and an ambulatory garment having integral upper torso and lower torso portions,

said upper torso portion having a front and back and at least two closeable openings, each having two sides when open and extending generally vertically of the bag and provided with closure elements on each side of said opening which can selectively open each vertical opening and engage another vertical opening closure element so as to be capable of closing each vertical opening to form at least one separate closed arm shaped portion in said upper torso portion;

said lower torso portion having at least two closeable openings, each having two sides when open and extending vertically of the bag and provided with closure elements on each side of said opening which can selectively open each vertical opening and engage the other open vertical opening closure element to close each vertical opening in a manner to leave an opening from said front to said back of said sleeping bag while forming two closed generally leg shaped portions in said lower torso portion of said sleeping bag; and

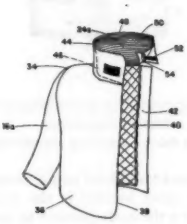
at least two separate closeable openings each at the lower extremities of said leg shaped portions for receiving each of the feet of the user of the sleeping bag.

4,507,806

PROTECTIVE GARMENT

Christopher E. Coombs, Boonton Township, Morris County, N.J., assignor to Cairns & Brother, Inc., Clifton, N.J.

Filed Feb. 28, 1983, Ser. No. 470,462
Int. Cl.³ A41D *3/02, 1/00*
U.S. Cl. 2—85 **10 Claims**



1. A multilayered protective overcoat for firefighters comprising:

a outer protective shell having an openable body portion, said openable body portion defining a neck opening;

an inner lining constructed of a thermal insulation layer; said inner lining having an openable body portion;

a moisture barrier layer;

a first collar secured to said inner lining, said first collar having a moisture impervious layer and a circumferential flap, said first collar defining a neck opening coincident with said neck opening of said outer protective shell, said collar extending through and beyond said neck opening of said outer protective shell to form a readily observable exterior collar of the assemblage of said outer protective shell and said inner lining; and

a fastening means for removably securing said inner lining to said outer protective shell proximate to said first collar of said inner lining, said fastening means being disposed beneath said circumferential flap and protected by said circumferential flap.

4,507,807

WORK GLOVE FINGER STRUCTURE

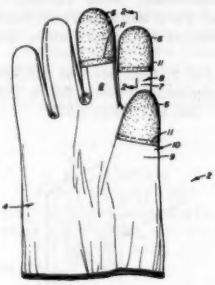
Kip M. Karkanen, 256 Castle Glen Rd., Walnut Creek, Calif. 94595

Filed Apr. 18, 1983, Ser. No. 485,696
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—161 R **12 Claims**

1. A glove of the type having a glove body including a relatively loose fitting palm covering portion and at least one glove finger with an inside surface the improvement comprising:

a band of high-friction material applied to said inside glove

finger surface to allow at least the tip of said glove finger to be frictionally retained and tightly drawn over a user's



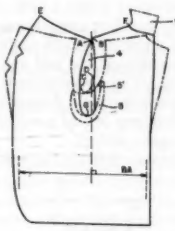
finger inserted therein while allowing the remainder of said glove body to be relatively loose fitting.

4,507,808

METHOD OF MANUFACTURING CLOTHING

Antonelli Montalto, 48 Rues deBerry, Paris, France

Filed Dec. 5, 1983, Ser. No. 558,264
Claims priority, application France, Dec. 8, 1982, 82 20566
Int. Cl.[3] A41D *27/10*; A41B *1/08*
U.S. Cl. 2—243 B **6 Claims**



1. A method for constructing fabric panels for use in garments having armholes comprising the steps of:

providing fabric from which a main panel forming one half of a garment is to be constructed, said main panel having an upper chest portion containing an armhole area and a lower waist portion having a width determined by the hip size of a garment to be constructed;

defining a rectangular area on said fabric, the width of the rectangle being equal to the sum of the width determined for said lower waist portion plus an allowance for a back seam and an allowance for buttoning the garment;

cutting said main panel from within said rectangular area in accordance with a predetermined pattern, said pattern including a narrow partial armhole cut-out portion of insufficient width to form a useful armhole and an auxiliary cut-out portion extending from the bottom of said partial armhole cut-out portion;

spreading the edges of said partial armhole cut-out portion apart to enlarge the width thereof to a useful size;

providing an auxiliary fabric panel having an upper edge shaped to form the bottom of a useful armhole, and

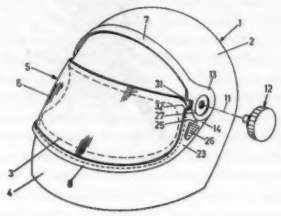
sewing or otherwise fixing said auxiliary fabric panel to said main panel to cover said auxiliary cut-out portion with the upper edge of said auxiliary fabric panel cooperating with the spread edges of said partial armhole cut-out portion to maintain said edges in said spread condition and form a completed armhole cut-out portion.

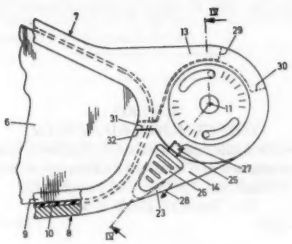
4,507,809

VISOR FOR A PROTECTIVE HELMET

Walter Stepan, Allersberg, Fed. Rep. of Germany, assignor to Uvex Winter Optik GmbH, Fürth, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,754
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 8137527[U]
Int. Cl.[3] A42B *3/02*
U.S. Cl. 2—424 **3 Claims**





1. In combination with a motorcycle protective helmet including a head-covering shell, a visor having at least one transparent panel and a frame with a groove, recess or the like all around for receiving the panel, comprising:

said frame including at least two pivotably interconnected frame parts and means for securely locking said frame parts together when the frame is in a panel retaining position,

at least one frame part being pivotably mounted, relative to, and into overlying relationship with, said helmet shell, so that said transparent panel can be removed from the groove, recess or the like,

said frame parts each including lateral portions having pivot bearing means resting against one another and pivotable relative to one another, and

a locking bar slidably supported by one frame part in the area of one pivot bearing means and slidable into a recess in the other pivot bearing means.

4,507,810

IMPLANTABLE BREAST PROSTHESES

Lennart O. Bartholdson, Umea, Sweden, assignor to Polar-Plastik HB, Umea, Sweden

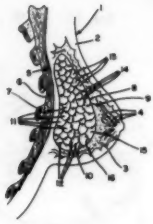
Continuation-in-part of Ser. No. 122,767, Feb. 19, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 343,930
Claims priority, application Sweden, Feb. 19, 1979, 7901424
Int. Cl.[3] A61F *1/00*
U.S. Cl. 3—36 **4 Claims**

1. An implantable breast prosthesis comprising:

a flexible shell formed of bio-compatible material;

a plurality of individual, irregularly shaped cells of different sizes defined by cell walls and encompassed within and completely filling said shell, with adjacent cells having walls in contact and attached with each other, each cell

containing a liquid material and having at least one passageway formed in the cell wall and in direct communication with a passageway formed in the cell wall of an adjacent cell to provide fluid communication between adjacent cells; and



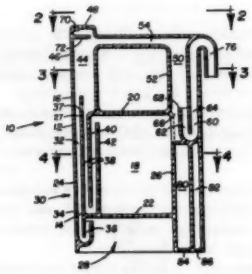
a liquid partially filling said shell and cells, said passageways formed in the cell walls permitting movement of the liquid from one cell to an adjacent cell so that the liquid flows between the cells to simulate natural breast movements.

4,507,811

TOILET BOWL DISPENSER

Jack Buelow, Danville, and Michael A. Darland, Hayward, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Jul. 7, 1981, Ser. No. 281,152
Int. Cl.³ E03D *9/02*
U.S. Cl. 4—225 **20 Claims**



1. A toilet bowl cleaner dispenser for dispensing a preselected amount of saturated solution after each flushing of a toilet bowl comprising,

a reservoir constructed for disposing within a toilet tank and for holding a chemical agent to be discharged,

measuring means for holding a preselected measured, discrete quantity of solution to be dispensed,

fill means for filling said measuring means from said reservoir upon flooding of the reservoir,

air pressurizing means for providing pressurized air in response to rising ambient tank water for discharging solution from the measuring means,

combined water inlet and air conduit means for flooding the reservoir with toilet tank water between flushes, and for communicating a surge or air pressure from the air pressurizing means to said measuring means, prior to said flooding and

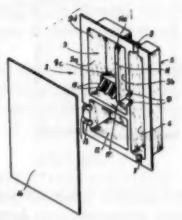
discharge means connecting the measuring means for discharging solution from the measuring means.

4,507,812

DISPENSER FOR A TOILET

Jean Dubois, Montmorency; Alain Lacroix, Jouy-en-Josas; Lucienne Forestier, Paris, and Jean-Pierre Steiner, Versailles, all of France, assignors to Lesieur-Cotelle, Boulogne-Billancourt, France

Filed Jul. 5, 1983, Ser. No. 510,920
Claims priority, application France, Jul. 5, 1982, 82 12037
Int. Cl.³ E03D *9/02*
U.S. Cl. 4—228 **20 Claims**



1. A dispenser for discharging a solid substance into a tank of a toilet comprising a receptacle of generally parallelepipedal configuration adapted to be positioned vertically in the tank, said receptacle comprising a base and a cover applied to said base, said base and said cover defining a first relatively long and narrow cell formed with upper and lower openings adapted to communicate with the tank, a second cell provided with a partition subdividing it into a first compartment and a second compartment, said first compartment communicating with said first cell by a pair of orifices spaced vertically along the longitudinal dimension of said cell and with said second compartment by passages at opposite ends of said partition, said second compartment having a deep portion positioned at an elevation lower than one of said passages and higher than the other of said passages; and

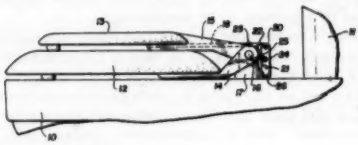
a body of said substance solidified in situ in said deep portion.

4,507,813

TOILET SEAT AND LID LOCK

William J. Lawson, R.D. 1, Box 299E, Milton, Del. 19968, and William L. Gunter, 1904 Kingswood Dr., Salisbury, Md. 21801

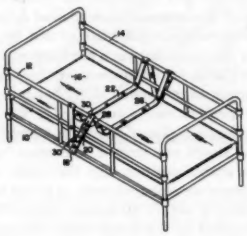
Filed Aug. 22, 1983, Ser. No. 525,441
Int. Cl.³ A47K *13/00*
U.S. Cl. 4—253 **5 Claims**



5. A toilet seat lid lock comprising in combination with a toilet seat lid which is pivotally mounted on a first transverse pivot axis somewhat above the top surface of a toilet bowl with which said lid is associated, an elongated mounting bar fixed on said lid longitudinally and extending rearwardly of the lid to a location somewhat rearwardly of said first transverse pivot axis when the lid is in a closed substantially level position, a locking arm pivotally attached to the rear end of said mounting arm and being disposed rearwardly of said first transverse pivot axis on a second parallel transverse pivot axis, a stop surface for the locking arm on the mounting bar somewhat forwardly of said second transverse pivot axis and limiting pivotal movement of the locking arm in one direction when the

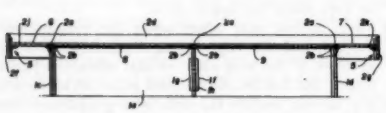
locking arm is in depending substantially perpendicular relationship to said mounting bar, said locking arm having an end face adapted to abut the top surface of a toilet bowl with which said lid is associated to block raising of the lid on said first transverse pivot axis, and a spring connected between the locking arm and mounting bar and biasing the locking arm toward engagement with said stop surface, said spring yielding to allow rotation of said locking arm on said second transverse pivot axis to an angular position whereby said lid may be raised.

4,507,814
PATIENT LIFT
Leonard C. Zyki, Jr., 8204 Greenshire Dr., Tampa, Fla. 33614
Filed Jun. 16, 1983, Ser. No. 504,898
Int. Cl.³ A61G 7/10
U.S. Cl. 5—84 **5 Claims**



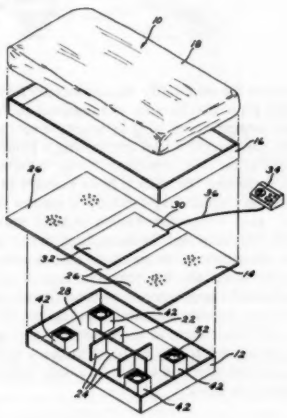
1. A patient lift of the type primarily intended for use in combination with a bed frame having opposing side rails and a mattress therebetween, said patient lift comprising: a strap means defined by a length of web material having first and second ends; said first end depending downwardly over the outside of a first bed side rail; a first segment of said strap means depending downwardly over the inside of the first bed side rail, across the mattress, and then upwardly and over the second bed side rail and downwardly therefrom; a loop formed in said strap means to define the beginning of a second segment of said strap means; said second segment extending upwardly from said loop, over said second bed side rail, across the mattress, and then upwardly and over the first bed side rail and downwardly therefrom to said second end; means for fixing said first and second ends to the bed frame; and stirrup means movably mounted on said strap means at said loop, whereby a patient reclining across said first and second segments on the mattress may be lifted therefrom by applying a downward force to said stirrup means, said stirrup means comprising a foot ring having an eye formed therewith and a hook mounted on the bed frame, whereby the patient may be held in an elevated position by engaging said hook in said eye after stepping downwardly on said foot ring.

4,507,815
PLATFORM BED AND CORNER CONNECTOR
Peter Danko, Alexandria, Va., assignor to The Bed Store, Alexandria, Va.
Filed Aug. 9, 1982, Ser. No. 406,161
Int. Cl.³ A47C 19/00; B25G 3/36
U.S. Cl. 5—400 **13 Claims**



1. A platform bed comprising a pedestal portion, a platform portion supported by said pedestal portion and a mattress assembly supported by said platform portion; said pedestal portion comprising a pair of spaced, parallel, longitudinally extending side frame members, a pair of spaced, parallel, transversely extending end frame members, corner fastening means connecting adjacent ends of said side and end frame members, partition means positioned intermediate the end frame members and extending between the side frame members, means connecting the opposite end of said partition means to a respective side frame member; said platform means comprising a pair of spaced, parallel, longitudinally extending side frame members, a pair of spaced, parallel, transversely extending end frame members, corner fastening means connecting adjacent ends of said platform side and end frame members, said fastening means having a body portion including a pair of arms disposed at a right angle to each other to conform to the inside corner platform portion formed by the side and end frames, a pair of divergent fingers formed on the outer edges of each arm, the major axis of said divergent fingers extending normal to the longitudinal axis of the respective arms, groves formed in the platform side and end frame members, said divergent fingers being slidably received in said groves and frictionaly retained therein, panel support means connected to the pedestal end frame members, the partition, the platform side and end frame members, and panel means mounted on said support means forming a horizontal surface, said mattress assembly being supported on said panel means.

4,507,816
WATERBED WITH SOUND WAVE SYSTEM
Gray H. Smith, Jr., 1257 Cherokee Rd., Louisville, Ky. 40204
Filed Dec. 21, 1983, Ser. No. 564,110
Int. Cl.³ A47C 31/00, 27/08
U.S. Cl. 5—451 **2 Claims**



1. In combination with a waterbed having a floor pedestal of open frame construction including a separate internal pedestal support of vertical partitions both supporting a planar deck which, in turn, supports a second open frame construction within which a water-filled bladder mattress is confined; the invention comprising:

a. a waterbed sound system having four loudspeaker housings that are each adapted to be located in one of the four quadrants of the floor pedestal measured from head to foot of the pedestal as well as from left to right thereof;

b. each loudspeaker housing being of vertical tubular construction having a height substantially equal to the height of the said pedestal frame, the sides and bottom of the

tubular housing including layers of acoustic insulation, a loudspeaker positioned in the upper portion of the tubular housing and facing in an upward direction;

c. a plurality of openings formed through the deck in the area that is aligned with the top portion of each loudspeaker housing;

d. said loudspeakers being wired to an external balance control box having a first volume control as well as a left and right hand as well as head and foot speaker volume control capability;

e. said external balance control box being wired to a stereo amplifier means of a stereo radio sound system;

f. wherein each loudspeaker housing is positioned near the center of one of the four quadrants of the floor pedestal, where the loudspeaker housings are surrounded by dead-air space within the floor pedestal, and extra acoustic insulation is positioned in the bottom portion of each loudspeaker housing to reduce the possibility of sound traveling down through the floor supporting the waterbed.

4,507,817

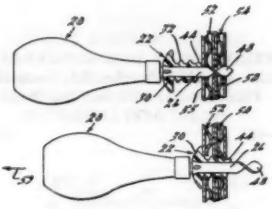
CONNECTOR AND INSERTION TOOL

Stanley E. Staffeld, 1621 Woodsboro, Royal Oak, Mich. 48067

Filed Oct. 8, 1981, Ser. No. 309,912

Int. Cl.³ B25F 1/00

U.S. Cl. 7—158 **18 Claims**



1. A system for essentially monomanually fastening together at least two plies of relatively soft material such as corrugated board, said system comprising an insertion tool and at least one connector, the insertion tool comprising a handle and an elongated penetration shaft attached to said handle, said penetration shaft including flat ribbon helix portion at the distal end thereof and an overall length which is greater than that of the connector, said connector having a head and body with a passageway therethrough for mounting on said shaft, whereby when the connector is mounted on insertion tool, at least an operative portion of the flat ribbon helix portion extends ahead of the body of the connector to be turned through the material in a controlled fashion thereby allowing the shaft of the tool with the connector thereon to be inserted through the plies of material, the connector to be fixed in place holding the plies together, and the insertion tool to be axially withdrawn leaving the connector in place.

4,507,818

COLLAPSIBLE HAIRBRUSH

Antonio L. Perdiz, c/o Mrs. Manuella Gilmore, 912 Bellmore Rd., North Bellmore, N.Y. 11710

Filed Jul. 28, 1982, Ser. No. 402,508

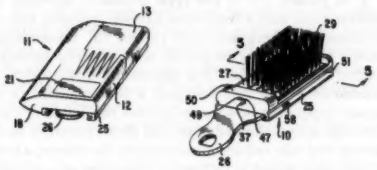
Int. Cl.³ A46B 9/10

U.S. Cl. 15—203 **6 Claims**

1. A collapsible hairbrush comprising,

a base plate including a rectangular base member, first and second end walls situated at the longitudinal ends, said end walls extending upwardly from the base member, said first end wall having a plurality of depressions at the inner side of the base member, said second end wall having a curved opening with locking depressions at both ends thereof, a supporting wall adjacent and parallel to the second end wall, said supporting wall having a plurality of notches, number of which corresponds to the number of depression at the first end wall, a space being formed between the supporting wall and the second end wall, two outer grooves provided along the longitudinal outer sides of the base member, and two side margins extending downwardly from the longitudinal outer sides of the base member, said side margins having two inner grooves at the respective inner sides thereof and at least two groove openings provided at the respective inner grooves,

a plurality of bristle supporting plates, number of which corresponds to the number of the depressions of the first end wall and the notches of the supporting wall, each bristle supporting plate having a main member, a first end shaft attached to an end of the main member and rotationally situated in the depression of the first end wall, a second end shaft attached to the end of the main member opposite to the first end shaft and rotationally situated in the notch of the supporting wall, and a biased shaft connected to the second end shaft so that the biased shaft is located in the space between the supporting wall and the second end wall, said main member having an upper surface, an upper edge situated along one longitudinal side of the main member and a lower edge situated along the other longitudinal side of the main member so that when the biased shafts are moved, the main members rotate between a usable position that the upper surfaces of the main members are oriented parallel to the base member of the base plate in which the upper edges of the main members are located on the lower edges of the adjacent main



members to thereby support the edges of the main members with each other and a folding position that the upper surfaces are oriented perpendicular to the base member,

a plurality of bristles attached to said bristle supporting plates to extend substantially upwardly from the upper surface of the main member,

collapsible means situated in the space between the supporting wall and the second end wall, said collapsible means including a shifting plate having a plurality of openings for receiving the biased shafts of the bristle supporting plates, and at least one shifting projection connected to the shifting plate, said shifting projection extending through the curved opening of the second end wall so that when the shifting projecting is moved along the curved opening, the shifting plate moves to thereby rotate the bristle supporting plates between the usable position and the folding position, said shifting plate, when the shifting projection is disposed in the locking depressions, being locked in one of the usable position and the folding position,

a space cover for covering the space between the supporting wall and the second end wall so that the shifting plate can be kept inside the space cover,

a cover having side edges along the longitudinal edges thereof, said side edges being engageable with the outer grooves of the base plate so that when the hairbrush is folded, the bristles and the base plate can be covered, and

a grip having flexible tail ends with projections extending outwardly from the tail ends, and side edges engaging the inner grooves of the side margins of the base plate, said grip being held between the side margins when the hair-

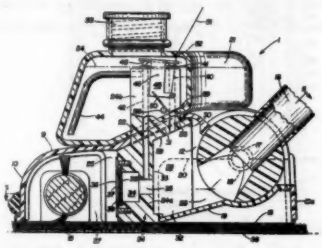
brush is folded and being extended from the side margins when the hairbrush is used so that the projections are engaged with the groove openings.

4,507,819

POWER NOZZLE SUDSER FOR CANISTER TYPE VACUUM CLEANER

Eugene F. Martinec, East Cleveland, Ohio, assignor to Health-Mor, Inc., Chicago, Ill.

Filed Feb. 16, 1984, Ser. No. 580,737
Int. Cl.³ A47L *11/34*
U.S. Cl. 15—321 **11 Claims**



1. In a power nozzle for a canister vacuum cleaner of a type in which the canister power unit housing has spaced blower and suction outlets, in which the power nozzle has a nozzle housing and a power driven brush operative through a brush opening in the nozzle bottom plate to brush floor areas engaged by said nozzle, and in which said nozzle communicates through a tubular manipulating wand and a flexible hose with a housing outlet, wherein the improvement comprises a construction wherein

(a) the nozzle housing has housing top and side walls and a flat bottom plate adapted for sliding engagement with a floor area being cleaned, and said housing walls and bottom plate form a compartment;

(b) a suds solution-containing tank mounted on the housing top wall;

(c) suds control means having a partition portion located in said compartment dividing said compartment into a pressure section, and a brush section in which said power driven brush is located;

(d) said control means having a mounting portion extending from said partition portion through said housing top wall into the tank;

(e) first passage means formed in said mounting portion communicating between said compartment pressure section and the interior of the tank;

(f) the control means partition portion being formed with an air-fluid chamber having a screen-contained discharge outlet, and an inlet communicating with said pressure section;

(g) second passage means extending through said mounting and partition portions from a zone adjacent the bottom of the tank to said chamber inlet;

(h) said control means also including first and second valves, respectively, for said first and second passage means;

(i) a valve actuator movably mounted in the tank on said mounting portion having first and second valve closure members, respectively, for said first and second valves;

(j) said actuator being biased normally to a valve control closed position in which the first closure member closes said first valve and said second valve is open;

(k) said control means also including a control member connected with said movable valve actuator and extending to a location outside the tank accessible at a handle portion of the manipulating wand, for moving said valve actuator from said normal valve control closed position to a desired degree of opening of said first valve; and

(l) the nozzle hose being connected with the blower outlet of said canister power unit housing;

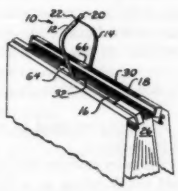
(m) whereby valve actuator is moved out of valve closed position when the canister power unit is energized, air under pressure is blown from the canister blower outlet into said pressure section through said first passage means into said tank establishing pressure on suds solution in the tank forcing solution in said tank to flow through said second passage into said air-fluid chamber inlet into air under pressure passing from said pressure section through said inlet and into said air-fluid chamber where said suds solution and air are mixed and blown through said screen contained discharge outlet to form suds in said housing brush section which are discharged through the bottom plate brush opening around the brush operating through said brush opening to suds-scrub floor covering on the floor area along which the nozzle is slidably moved back and forth for suds-cleaning.

4,507,820

CONCEALABLE HANDLE WITH A SLIDABLE PIVOT

Dale M. Purcocks, 27 Beechwood Close, Boghall Rd. Bray, Wicklow, Ireland

Filed Jul. 7, 1983, Ser. No. 511,523
Int. Cl.³ B65D *25/32;* **E05D** *11/08, 13/08*
U.S. Cl. 16—125 **4 Claims**



1. A concealable handle for carrying an article having parallel first and second elongated channels with a U-shaped cross-section, each channel having two elongated lips, one projecting from each side of the U-shaped cross-section toward the opposite side, the handle comprising:

a first strap means having a first end, a second end, a pivot near the first end, a fitted portion near the pivot, and an attachment means near the second end, the first strap means proportioned to fit in the first channel and being slidable in said first channel when the first strap means lies parallel to said first channel;

a second strap means having a first end, a second end, a pivot near the first end, a fitted portion near the pivot and an attachment means near the second end, the second strap means proportioned to fit in the second channel and being slidable in said second channel when the second strap means lies parallel to said second channel;

wherein the pivots are substantially rectangular with longitudinal dimensions approximately equal to the inner dimension of the channel from the bottom of the channel to the inside edge of the lip whereby movement of the strap means past the position at which the pivot is wedged between said bottom and said lip is restricted; and

wherein the pivots have widened sections proportioned to fit in the channels such that the pivots are restricted from escaping past the channel lips;

wherein the fitted portions have a width approximately equal to the distances between the lips of each channel.

4,507,821

PLASTIC HANDLE ASSEMBLY

Helge D. Jorgensen, Copenhagen, Denmark, assignor to Superfos Emballage A/S, Vipperod, Denmark

Filed Aug. 9, 1982, Ser. No. 406,476

Claims priority, application Denmark, Aug. 11, 1981, 3565/81

Int. Cl.³ B65D *25/32*

U.S. Cl. 16—126 **2 Claims**

1. A bucket handle comprising:

(a) an elongated handle member having an aperture adjacent each end thereof; and

(b) a pair of fastening knobs for attaching the handle member to a bucket, each fastening knob including

(i) a shank axially aligned with an aperture for movement therethrough;

(ii) breakable fin means connecting a first end of the shank to the handle member adjacent said aperture, and

(iii) barb-like anchoring means attached to the shank adjacent the first end thereof, said anchoring means facing toward a second end of said shank and having a size larger than said aperture,

(iv) the second end of each shank being free for attachment to said bucket, and

(v) said barb being of elastically resilient construction to facilitate pressing said barb through said aperture with said shank after the second end of the shank has been connected to the bucket for securing the end of the handle member on the shank between the bucket and barb,

the elongated handle member is constructed of molded plastic;

the barbs are integrally molded to the handle member by way of said fin means;

each shank is of smaller outside dimension than the adjacent aperture, said shank acting as a fixed pivot for rotatably mounting the handle member on the shank.

4,507,822

AUTOMATIC MACHINE FOR SPLITTING BUTCHERY ANIMALS, NOTABLY PIGS

Jean-Frédéric Herubel, Guebwiller, France, assignor to N. Schlumberger and Cie, Guebwiller, France

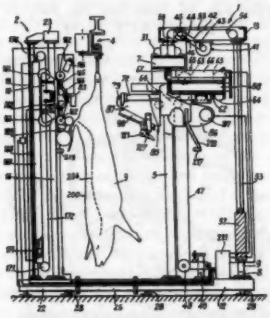
Filed Nov. 14, 1983, Ser. No. 551,314

Claims priority, application France, Nov. 15, 1982, 82 19057

Int. Cl.³ A22B *5/20*

U.S. Cl. 17—23 **3 Claims**

1. An automatic machine for splitting butchery animals, notably pigs, characterized in that it comprises: a first fixed column (**1**), a second fixed column (**2**) providing, between itself and the first fixed column, a receiving interval for an animal to be split (**3**); a vertical splitting carrier (**7**) mobile along the first fixed column; a horizontal splitting carrier (**62**) mobile horizontally on the vertical splitting carrier so as to move toward and away from the second column; a splitting head (**85**) rigidly connected to the horizontal splitting carrier; a splitting blade (**98**) mounted on the splitting head and imparted, in its own plane, with an oscillating motion having horizontal and vertical components; a dorsal guiding carrier (**18**) for the animal to be split, vertically mobile on the second fixed column; a dorsal guide (**185**) mobile on the dorsal guiding carrier, in the direction of the first fixed column; two horizontal arms (**71, 72**) for laterally encompassing the animal to be split, rigidly connected to the horizontal splitting carrier and the distal ends of which carry end-pieces (**78, 79**) adapted for engaging respectively two recesses (**82**) having a shape matching that of said end-pieces, formed into pads (**83, 84**) rigidly connected to the dorsal guiding carrier; inner guiding means (**21**) of the spine of the animal to be split, carried by the splitting head; control means (**66**) for the movements of the horizontal splitting carrier (**62**); control means (**41** through **48**) for the working downward stroke of the vertical splitting carrier (**7**) and for the rapid off-load return stroke of said carrier; means (**168**) for the rapid return upward stroke of the dorsal guiding carrier (**18**); resilient means (**196**) for controlling the application of the dorsal guide (**185**) against the back of the animal to be split; means (**4**) adapted for bringing in the aforementioned interval between the two fixed columns (**1, 2**) an animal to be split and hung by its rear legs, and for carrying it away; means (**217, 219, 221**) for determining the effective stroke length of the vertical splitting carrier (**7**); and a programmer (**221**) for the sequential activation of all the aforementioned control means for carrying out the successive splitting cycles.



4,507,823

FISH PROCESSING MACHINE WITH CONTROLLING MEANS FOR THE PROCESSING TOOLS

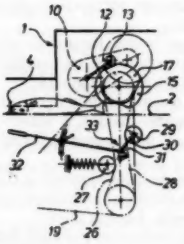
Hermann Wulff, Müllergrund 4a, 2400 Lübeck 16, Fed. Rep. of Germany

Filed Jan. 17, 1983, Ser. No. 458,176

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202140

Int. Cl.³ A22C *25/14*

U.S. Cl. 17—55 **6 Claims**



1. A fish processing machine comprising at least one processing tool,

means mounting said processing tool for movement into and out of engagement with the fish to be processed,

cam means for controlling the the processing startpoint and the working course of said processing tool, said cam means including a main cam rotatably mounted on a main cam axis and having a cam surface coupled to said processing tool for controlling movement of the latter, and a cam segment mounted immediately adjacent to said main

cam for independent turning movement relative to said main cam,

intermediate drive means for rotating said main cam and said cam segment,

first belt drive means connecting said intermediate drive means to said main cam, and second belt drive means connecting said intermediate drive means to said cam segment for normal synchronous rotation of said cam segment with said main cam, without relative movement therebetween, said second belt drive means having a pushing run and a pulling run, and

selectively-movable tensioning means for applying tension upon a run of said second belt means, whereby to cause relative movement between said cam segment and said main cam and vary the cam surface of the latter.

4,507,824

DEVICE FOR FILLETING BEHEADED FISH

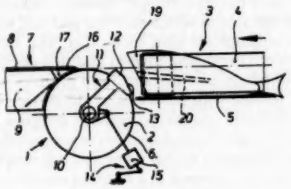
Axel Sawusch, Pelzerstrasse 13, 2400 Lübeck, Fed. Rep. of Germany

Filed Feb. 14, 1983, Ser. No. 466,322

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206274

Int. Cl.³ A22C *25/08, 25/16*

U.S. Cl. 17—61 **9 Claims**



1. A device for filleting beheaded fish having belly spokes and led to a filleting apparatus in a moving direction and in their swimming position with their beheaded end leading and belly downward, said device comprising

(a) tool means including circular knive means having cutting edge means for cutting free said belly spokes,

(b) guide means for supporting said belly of said fish via supporting edges,

(c) transfer element means associated with said circular knife means and including guiding edge means, said transfer element means being mounted for movement between a basic position covering at least an area of said cutting edge means facing said fish at its arrival, to a working position in said moving direction of said fish to set free said area of said cutting edge means, in which working position said guiding edges of said transfer element lie flush with said supporting edges of said guide means as a continuation thereof, and

(d) surface means on said transfer element means located in said basic position to be engaged by the beheaded end of said fish travelling in said moving direction, whereby said fish moves said transfer element to its working position with said circular knife means opening the belly cavity of the fish and the transfer element means penetrating the belly cavity and engaging and raising the spinal column of the fish to the level of said supporting edges.

4,507,825

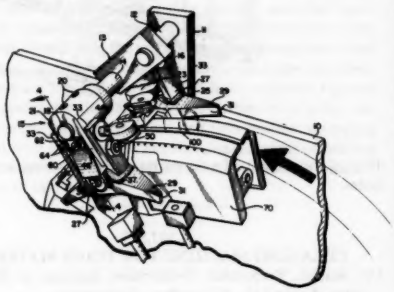
SELF-ADJUSTING TAIL BREAKER MEANS

Edmund D. Betts, Libertyville, and Jon T. Keith, Wheeling, both of Ill., assignors to Gregor Jonsson Associates, Inc., Highland Park, Ill.

Filed Aug. 25, 1983, Ser. No. 526,460

Int. Cl.³ A22C *29/02*

U.S. Cl. 17—73 **16 Claims**



1. A shrimp processing apparatus having a tail breaking station where the main portion of a shrimp shell is fractured from the shrimp tail without removing the tail, said apparatus comprising:

holder means for gripping and ultimately moving shrimp to be processed through and tail breaking station;

said holder means including at least a first and second clutch means each having tines adapted to enter a shrimp shell disposed in said holder means;

said first clutch means being adapted to pivot relative to said second clutch means to effect a stroke between said first and second clutch means;

a first cam follower adapted to act against a first cam means to cause said first and second clutch means to pivot relative to each other;

a second cam follower adapted to act against a second cam means to cause said first and second clutch means to move toward or away from a shrimp being processed;

a first fixed cam means adapted to contact said first cam follower; and,

a second cam means pivotable about said first cam member and adapted to contact with second cam follower whereby different size shrimp can be accommodated in said apparatus and said second cam means can pivot outwardly away from said holder means as the size of said shrimp increases.

4,507,826

METHOD AND APPARATUS FOR OPENING FIBER BALES

Alex J. Keller, 75 Ridgeport Rd., Clover, S.C. 29710, and Akiva Pinto, 525 Eastwood Dr., Gastonia, N.C. 28052

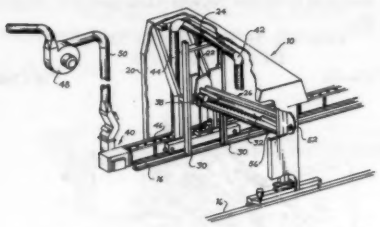
Filed Oct. 13, 1982, Ser. No. 434,010

Int. Cl.³ D01G *7/04*

U.S. Cl. 19—80 R **24 Claims**

1. Apparatus for removing fiber from a plurality of fiber bales arranged adjacent one another in a predetermined alignment, said apparatus including carriage means movable in a direction along said aligned bales, and head means supported by said carriage for movement therewith and selectively movable in a vertical direction for making contact with the top of said bales, said head means including a rotatable member formed with fiber engaging means for engaging and removing said fiber from the top of said bales during movement of said carriage means along said bales, said rotatable member being

mounted in said head means with the axis of rotation of said rotatable member at an acute angle with respect to said direc-



tion of movement of said carriage means along said aligned bales.

4,507,827

CLEANING MACHINE FOR FIBER MATERIAL

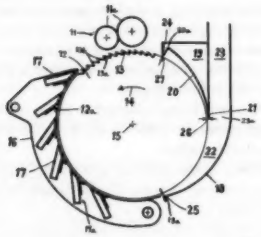
Urs Staehli, Turbenthal, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Oct. 24, 1983, Ser. No. 544,860

Claims priority, application Switzerland, Nov. 5, 1982, 6445/82

Int. Cl.³ D01B *3/00*

U.S. Cl. 19—200 **8 Claims**



1. A cleaning machine for fiber material comprising:
an opening roller rotatable about an axis of rotation thereof and having a roller envelope;
clothing having points and provided for said opening roller;
said roller envelope containing the points of the clothing;
a feed device for infeeding of the fiber material to the opening roller;
a grating formed of bars cooperating with the opening roller;
a suction chamber cooperating with the opening roller;
a screening member cooperating with the opening roller;
said feed device, said grating, said suction chamber and said screening member being successively arranged around said opening roller and extending substantially over the length of the opening roller in the direction of the axis of rotation of said opening roller;
a nose member provided for said screening member;
a suction duct leading away from the suction chamber and in flow communication therewith;
said suction duct having an entry opening;
said nose member forming part of said entry opening of said suction duct;
said screening member having a screening wall extending away from the nose member in the direction of rotation of the opening roller over a part of said roller envelope containing the points of the clothing;
said screening wall having a rear end; and
the screening wall and roller envelope possessing a mutual spacing from one another which increases in the direction of rotation of the opening roller from the nose member to the rear end of the screening wall.

4,507,828

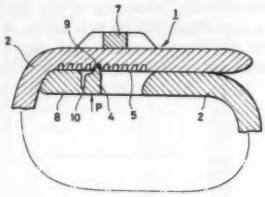
BUNDLING BELT DEVICE

Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Tokyo, Japan and Ben Clements & Sons, Inc., South Hackensack, N.J.

Filed Jul. 18, 1983, Ser. No. 514,753

Int. Cl.³ B65D *63/00*

U.S. Cl. 24—16 PB **8 Claims**



1. A bundling belt device comprising a head having first and second ends and projecting in a first direction intermediate said first and second ends, said head having an opening, and a belt member defining an axis extending along the length thereof coupled to and extending from said first end of said head, said opening in said head including a first opening portion extending in the axial direction of said belt member for passing said belt member therethrough and a second opening portion opening in a direction opposite to said first direction in which said head projects and communicating with said first opening portion, said head having a stopper member rockably formed in a portion of the area in which said first and said second opening portions communicate with each other, said stopper member having a tooth projecting toward said first opening portion in said first direction in which said head projects, said belt member being formed with serrations on the surface thereof facing a second direction opposite to said first direction in which said head projects, said stopper member being movable in said first and second directions so that when said belt member is inserted through said first opening in a fastened condition in use of the device applied to bundle objects, said tooth of said stopper member is acted upon by a reaction force exerted by the objects being bundled so that said tooth is firmly engaged with a portion of said serrations on said belt member.

4,507,829

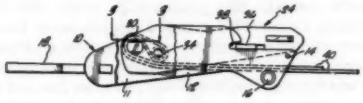
LIGHT WEIGHT TENSIONABLE BUCKLE

Robert Looker, 1509 E. El Segundo, El Segundo, Calif. 90245

Filed Apr. 21, 1983, Ser. No. 487,451

Int. Cl.³ A44B *11/12, 21/00*

U.S. Cl. 24—68 CD **2 Claims**



1. An over-center tensionable buckle for use with wide, flat straps and the like, comprising:
a. a body member having two parallel elongate side plates defining a void space therebetween;
b. a handle member having two parallel elongate side panels which define a void space therebetween to accommodate the strap, said handle member rotatable relative to said body member from an open position to a closed position about a journal pin which extends across said void space and is rotatably attached to and extends through said side

panels and is there fixedly and non-rotatably attached to said side plates, around which journal pin the strap is to be looped; and

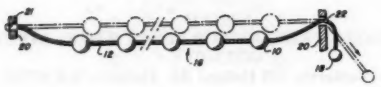
c. a load pin fixedly and non-rotatably attached to and extending between said side panels of said handle member such that said load pin contacts and pulls the slack out of the strap upon rotation of said handle member from its open position to its closed position.

4,507,830

HOLDER FOR SHEET-LIKE OBJECTS

Israel Dahan, 307/46 Gilo, Jerusalem, Israel

Filed Jun. 21, 1983, Ser. No. 506,329
Claims priority, application Israel, Jul. 2, 1982, 66218
Int. Cl.³ A44B *21/00*; A47F *7/16*
U.S. Cl. 24—527 **7 Claims**



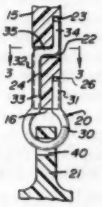
1. A rapid-action holder for sheet-like objects, comprising a profiled rail mountable on a wall or the like, said rail having in the position of mounting a substantially inverted-U-shaped cross section, the two flanges of which include with one another a relatively small angle in such a way that the inside of said U-shaped cross section is narrowest at the mouth portion thereof and is widening towards the web portion thereof, a plurality of beads linked to one another to form a coherent chain, said beads being too large to pass said narrowest portion of said U-shaped cross section, yet being small enough to freely move in the wider portion thereof, one end of said chain of beads being fixedly attached to one end of said rail, the other end of said chain of beads being pullably attached to the other end of said rail, said points of attachment at said rail ends being located at such a distance from said mouth portion that, whereas in the non-pulled state of said other end of said chain of beads at least some of said beads are resting within he mouth portion of said cross section touching both flanges, in the pulled state of said other end said chain of beads is tightened and said resting beads thereby lifted until none of said beads touches more than one of said flanges.

4,507,831

SPRING CLIP FOR TILTER WORM SHAFT

David K. McClure, Muncy, Pa., assignor to Marathon Manufacturing Company, Houston, Tex.

Filed Nov. 22, 1982, Ser. No. 443,579
Int. Cl.³ A44B *13/00*
U.S. Cl. 24—590 **8 Claims**



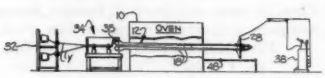
1. A spring clip connection comprising a shaft terminating outwardly in a shaft end, said shaft having a transverse through hole spaced inwardly from said shaft end, a body for connection to said shaft, a leg extending from said body, said leg having a proximate leg portion adjacent to said body and a distal leg portion remote from said body and offset laterally from said proximate leg portion, said leg having a transverse intermediate leg portion extending between adjacent regions of said distal and proximate leg portions, said leg being sized for insertion through said hole to locate said transverse intermediate leg portion rotatably in said hole with said distal and proximate leg portions on opposite sides of said shaft, and an arm extending from said body longitudinally of and spaced laterally from said proximate leg portion for location on the opposite side of said shaft as said proximate leg portion, said shaft having elongate recesses extending in opposite directions from opposite ends of said hole for respectively receiving said distal and proximate leg portions longitudinally in said recesses when said intermediate leg portion is in said hole, and said leg and arm being resiliently displaceable away from each other for snap engagement into said recesses and firm resilient clamping engagement with said shaft on angular displacement of said leg and arm about the axis of said intermediate portion on rotation of the latter in said hole.

4,507,832

METHOD AND APPARATUS FOR THE CONTINUOUS TREATMENT OF YARN

Erwin Steiner, Clover, S.C., and Peter H. Stahlecker, Charlotte, N.C., assignors to Technology Consulting Corporation, Charlotte, N.C.

Filed Sep. 23, 1982, Ser. No. 421,865
Int. Cl.³ D02G *1/20*
U.S. Cl. 28—248 **13 Claims**



1. A method of continuously treating a running yarn, and characterized by the ability to insure a substantially uniform treatment of all portions of the yarn and thereby avoid the production of off-standard yarn, and comprising the continuous steps of

forming a running yarn into helical loops,

conveying the thus formed loops at a predetermined speed through a treatment chamber and along an accumulation zone positioned downstream of the chamber,

withdrawing the loops from the accumulation zone,

monitoring the number of loops in the treatment chamber and accumulation zone,

providing a control signal upon the monitored number of loops exceeding a predetermined maximum, and also upon the monitored number of loops being less than a predetermined minimum, whereby the control signal will indicate a condition wherein the loops may remain in the treatment chamber for either an unduly long or an unduly short residence time,

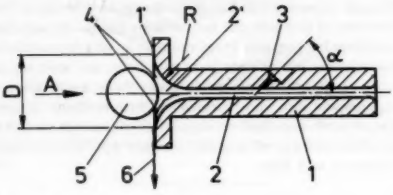
physically blocking the further advance of the loops at the downstream end of the accumulation zone, whereby the loops tend to gather and accumulate in a reverse direction along the accumulation zone in the event the withdrawing step is at an inadequate speed, and

selecting said predetermined maximum and said predetermined minimum number of loops so that the loops then present in the treatment chamber will pass through the treatment chamber in a predetermined residence time.

4,507,833
JET TEXTURING NOZZLE

Christian Simmen, Lichtensteig, Switzerland, assignor to Heberlein Maschinenfabrik AG, Wattwil, Switzerland

Filed Feb. 25, 1983, Ser. No. 469,683
Claims priority, application Switzerland, Mar. 10, 1982, 1472/82
Int. Cl.³ D02G 1/16
U.S. Cl. 28—254 15 Claims

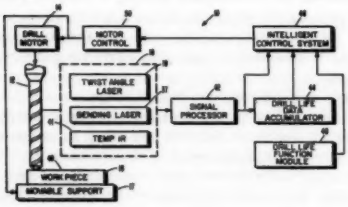


1. In a device for texturing at least one endless yarn consisting of a plurality of filaments, with a nozzle (1) supplied with a pressure medium, containing a yarn guide duct (2), at least one feed means (3) for the pressure medium terminating in the duct, an outwardly flaring, convexly curved outlet opening (2') of the duct (2), and a spherical or semispherical guide element (5) extending into the outlet opening and forming therewith an annular gap (4); the improvement in which the outer diameter (D) of the convexly curved outlet opening (2') of the duct (2) is at least equal to four times the diameter (d_1) of the duct and at least equal to 0.5 times the diameter (d_2) of the spherical or semispherical guide element (5).

4,507,834
DRILLING MONITOR

Tsu F. Chen, Dresher, and Edwin R. Phillips, Rosemont, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed May 27, 1983, Ser. No. 499,053
Int. Cl.³ B23Q 15/00; B23B 49/00
U.S. Cl. 29—26 R 5 Claims



1. A drilling monitor comprising:

means associated with a drill bit for measuring twist angle, including a first laser beam directed at a first reference point on said drill bit reflected to a first sensor, and a second laser beam directed at a second reference point on the drill bit reflected to a second sensor;

image measuring means associated with said drill bit for measuring bending including a third laser beam on a first side of said drill bit directed by a fiber optic bundle at a sensor on a second side of said drill bit, opposite said first side, whereby said drill bit interrupts a portion of said third beam;

means for measuring said drill bit temperature including an IR sensor directed at an intersection formed between said drill bit and a surface of an associated workpiece;

signal processing means coupled for receiving instantaneous measurements of twist angle, bending and temperature of said drill bit;

drill life data accumulator means coupled for receiving and accumulating instantaneous measurements from said signal processing means;

means for controlling motor power for driving said drill bit;

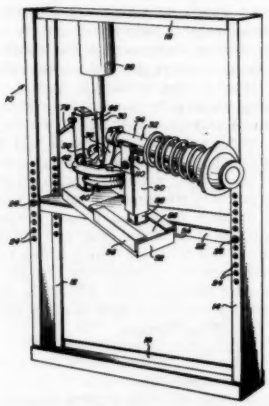
a drill life function module having preselected data therein;

an intelligent control system coupled for receiving said instantaneous measurements from said signal processor, said accumulated measurements from said accumulator and said preselected data from said drill life function module and for comparing said measurements and data and for responsively generating instructions to said motor control means.

4,507,835
ADJUSTABLE PRESS JIG FOR FRONT WHEEL STRUT ASSEMBLY

Robert L. Nankervis, 219 Holland Rd., Holmdel, N.J. 07733

Continuation-in-part of Ser. No. 306,144, Sep. 28, 1981, abandoned. This application Mar. 30, 1983, Ser. No. 480,451
Int. Cl.³ B25B 1/22; B30B 15/06
U.S. Cl. 29—251 10 Claims



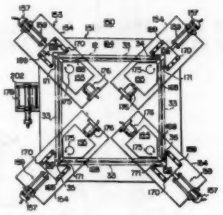
1. In combination with a force member advanceable along a predetermined path and stationary base means toward which said force member is movable along said path, said base means including a pair of supports spaced apart on opposite sides of said path, one of said supports including a mount supported therefrom for angular displacement about an axis transverse to a plane containing said path and said supports, said mount including a mounting shank supported therefrom disposed and swingable in said plane during angular displacement of said mount about said axis, the other of said supports including cradle means supported therefrom for angular displacement about an axis transverse to said plane and laterally adjustable along a path substantially paralleling the first mentioned path, said cradle means being adapted to cradle the main strut portion of a McPherson strut assembly and said mounting shank being securable through a ball joint mounting bore formed in a mounting portion of the knuckle carried by one end of said main strut portion with said mounting shank and cradle means being adjustable about the first mentioned axis and along the second mentioned path, respectively, for positioning the knuckle of said strut assembly in position with the wheel of bearing seats of said knuckle aligned with the first mentioned path.

4,507,836

ACCESS DOOR AND FRAMING APPARATUS FOR THE ACCESS DOOR'S FRAMEWORK

Naka Hiromitsu, c/o Tokyo Kenkyusho of Kabushiki Kaisha Naka Gijutsu Kenkyusho, No. 39, Oaza, Shinmachi, Yashio-shi, Saitama-ken, Japan

Division of Ser. No. 283,541, Jul. 14, 1981, Pat. No. 4,443,973.
This application May 19, 1983, Ser. No. 497,256
Int. Cl.³ B25B 5/14
U.S. Cl. 29—252 8 Claims



1. A framing apparatus for making a door frame from four framework elements having insertion grooves at least at the ends thereof and four corner members having locking holes therein, insertable into insertion grooves for holding the four framework elements together in square to form a temporary framework so as to have four inside corners and four respectively corresponding outside corners, the apparatus comprising:

a table for vertically supporting the temporary framework;

four inside blocks disposed on said table so as to be surrounded by the temporary framework, each of said inside blocks having an outside surface engagable with the temporary framework at a corresponding one of the four inside corners, said inside blocks having respective bores formed therethrough for extending toward the corresponding ones of the inside corners;

four outside blocks movably mounted on said table so as to be outside the temporary framework, each of said four outside blocks being opposed to and spaced from a corresponding one of said four inside blocks and having an inside surface for engaging the temporary framework at a corresponding one of the outside corners;

first pressing means, including first fluid pressure operated cylinders, for pressing said four outside blocks against the temporary framework so as to press the framework elements at the insertion grooves to fix the corner members therein; and

second pressing means, including press members, movably fitted in said bores in said inside blocks so as to be projectable outwardly of said outside surface of said inside blocks toward said inside surfaces of said outside blocks, said press members having respective pairs of projections for pressing portions of the framework elements with said pairs of projections so as to deform the portions and press the portions into the locking holes of the corner members while the inside and outside corners are respectively engaged by the inside and outside blocks.

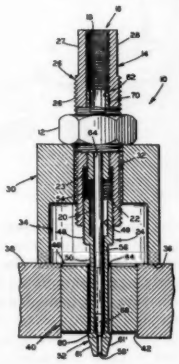
4,507,837

EXTRACTOR TOOL

Donald H. Hinkle, Reading, Pa., assignor to Dana Corporation, Toledo, Ohio

Filed Jul. 11, 1983, Ser. No. 512,305
Int. Cl.³ B23P 19/04
U.S. Cl. 29—262 1 Claim

1. An extractor tool for extracting an annular element, having an annular bore therein, outwardly from the top of a receiving opening in a supporting member, which receiving opening is surrounded by an upper supporting surface of the supporting member, comprising, a spacer member having a radially extending base with an axially extending opening in said base and from which base depends axially extending shoulder means, said shoulder means defining a space large enough to receive the annular element between the shoulder means and said base and with the lower end of said shoulder means being engageable with the upper surface of the supporting member at locations radially outwardly of the annular element, an axially elongated extractor sleeve slidably received in said axially extending opening in said base, said sleeve having a central threaded bore extending axially therethrough and said bore having an upper and a lower portion with the threads in said upper bore portion of said extractor sleeve being of an opposite hand from said threads in said lower bore portion thereof, threads on the outer surface of said extractor sleeve being of the same hand as the threads in said upper portion in said bore of said sleeve, a hollow extractor member with a threaded upper end threaded in said lower bore portion, said extractor member having an elongated lower end with a pair of expandible legs and said lower end being adapted to be received within the axial bore of the annular element, an expansion member having an upper threaded portion threaded in the upper bore portion of said sleeve and having an elongated depending portion extending into said hollow extracting element, said expansion member including means on its lower end for expanding the lower end of said extractor member radially outwardly upon said expanding member being threaded axially



into said sleeve, sao that when said lower end of said extractor member is within the bore of the annular element, said expander member can be operated for causing engagement therebetween, and forcing moving means operable between said extractor sleeve and said spacer member for moving said extractor sleeve axialiy outwardly relative to said spacer member to withdraw the annular element from the supporting member, said moving means comprising threads on the outer surface of said extractor sleeve, a nut means threaded on said outer surface of said extractor sleeve, with the lower surface of said nut means engaging the upper surface of said base of said spacer member, and means on said sleeve for cooperating with a holding means to prevent rotation of said sleeve, whereby upon rotation of said nut means while said extractor sleeve is held against rotation, outward movement of said sleeve relative to said spacer member occurs, said threads on the outer surface of said extractor sleeve are the same hand as the threads in said upper portion of said bore of said sleeve whereby if rotation of said nut means to cause outward rotation of said sleeve causes rotation of said sleeve, said expander is further tightened in said sleeve, said elongated lower end of said extractor member comprises a cylindrical portion secured to and extending downwardly from said threaded upper end of said extractor member and a knob means on the lower end of said cylindrical portion, said cylindrical portion being smaller in diameter than the bore in the annular element and said knob

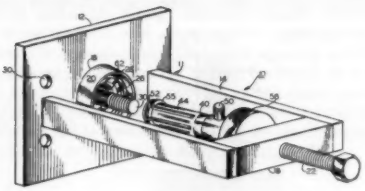
means being slightly larger in diameter than the bore in the annular element, said extractor element being long enough whereby said knob means will project below the annular element when the tool is mounted thereon, and upon expansion of said lower end of said extractor member, said knob means engages the lower surface of the annular member, said extractor member has concentric bores in said threaded upper end and elongated lower end thereof, said bore in said knob means of said lower end being of smaller diameter than said bore in the remainder of the cylindrical portion thereof, said expandible legs are formed by a pair of axial slots formed in said elongated lower end and extending up through the knob means and partially up the cylindrical portion, and said elongated depending portion terminates at its lower end in a rounded conical end which expands said extractor member upon entering the junction of the bores in said knob means and cylindrical portion.

4,507,838

TOOL FOR REMOVING AND REPLACING WHEELBEARINGS

Karl M. Hacker, 1921 Dover La., Castleton, N.Y. 12033

Filed Apr. 9, 1982, Ser. No. 366,865
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—263 **7 Claims**



1. A tool for removing or replacing a ring-shaped automotive-type wheelbearing from the bearing housing after removal of the hub, but without having to remove the axle or bearing housing and without applying pressure to the axle comprising:

an extractor member having an expandable end portion, and being operable between an advanced and a retracted position, said advanced position being such that the expandable end of the extractor member extends into the bearing housing past the bearing, said retracted position being such that the entire extractor member is without the bearing housing,

said extractor member including a cylindrical outer tube having a base and a plurality of fingers, said fingers having enlarged ends extending in one direction from the base and arranged in a spaced apart relationship with one another in an annular configuration around a common axis, and said fingers being biased in a normally collapsed state in which they can be inserted through the space between the central opening of the bearing and the axle and withdrawn therefrom without engaging the bearing, and

a cylindrical inner tube having a second base portion on one end and a flange located on the opposite end, said flange having an outer circumference which is larger than the circumference of the inner tube, wherein the inner tube is concentrically associated with the outer tube for spreading the fingers radially outwardly from their collapsed state to an expanded state so that they cannot pass through the bearing without engaging it and for returning their ends to their collapsed state, and the inner tube having a hollow portion adapted to receive the axle;

said extractor member including a means for thrusting a replacement wheelbearing into the bearing housing upon the movement of the extractor from its retracted to its advanced position; and

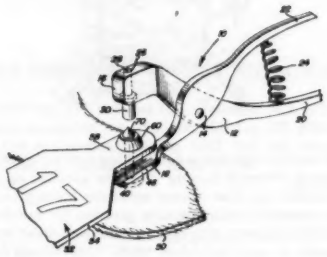
a frame member which is adapted to be rigidly secured to the automobile in a positon outside the bearing housing such that the extractor member is movably connected thereto and can be inserted into the housing to engage the bearing, said frame adapted to exert an outward extracting force on the bearing as the extractor is withdrawn from the housing, while simultaneously exerting an inward force on the bearing housing.

4,507,839

TWO-PIECE EAR TAG REMOVING TOOL

Floyd H. Simpson, 44680 Belmont-Centerville Rd., Belmont, Ohio 43718

Filed Aug. 2, 1983, Ser. No. 519,230
Int. Cl.³ B23P *19/04;* **B25B** *7/00*
U.S. Cl. 29—268 **7 Claims**



1. An ear tag removing tool including a pair of opposing jaws, means mounting said jaws for relative movement toward and away from each other, one of said jaws including an elongated stud supported therefrom including a free end projecting toward the other jaw, the other jaw defining a pair of laterally spaced generally parallel tongues having one pair of spaced apart ends and defining an open ended elongated slot therebetween opening endwise outwardly between said one pair of ends of said tongues, said free end of said stud being of a transverse dimension to be snugly lengthwise received through said slot upon movement of said jaws toward each other, said free end of said stud including an endwise outwardly opening recess formed therein for receiving the tapered enlarged tip of the male stud part of an animal ear tag therein, the surfaces of said tongues facing said one jaw being laterally inclined toward said slot and away from said one jaw, said recess comprising a conical recess.

4,507,840

METHOD FOR COMPACTING NUCLEAR REACTOR COMPONENTS

Leopold A. Steinert, and Richard W. Perry, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

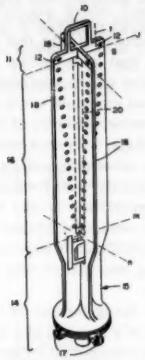
Filed Apr. 19, 1983, Ser. No. 486,524
Int. Cl.³ B23P *7/00*
U.S. Cl. 29—401.1 **15 Claims**

1. A method of compacting used control rod blades and fuel channels of the type employed in a boiling water reactor, each of said control rod blades comprising an elongate main blade structure of substantially uniform, cruciform cross section to define four quadrants, each control rod blade further including upper and lower portions at opposite ends of said main blade structure which depart from said cruciform cross section, each of said fuel channels including an elongate, hollow structure having a substantially square, uniform cross section throughout its length defined by identical, planar panels integrally joined at the rounded corner edges of the channel;

said method comprising the steps of:

removing said upper and lower portions from each of said control rod blades to retain said main blade structure;

sectioning each of said fuel channels into a plurality of elongate channel members; and



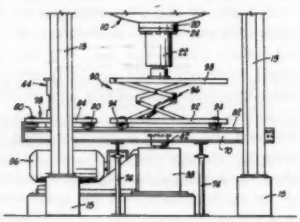
stacking said channel members so as to position them within the respective quadrants of said retained main blade structure substantially parallel to the long axis of said structure.

4,507,841

REMOVAL AND REINSTALLATION OF BOTTOM ENTERING AGITATOR SEALS

Robert E. Rickert, Aberdeen, Miss., assignor to Vista Polymers Inc., Houston, Tex.

Filed May 17, 1984, Ser. No. 611,511
Int. Cl.³ B23P *7/00*
U.S. Cl. 29—402.08 **7 Claims**



1. In a method of removing a seal unit from a process vessel bottom entering agitator assembly and reinstalling a seal unit therein wherein the assembly icludes an agitator positioned within the vessel, an agitator shaft connected to the agitator having a connector at the bottom end thereof adapted to be connected to a support collar which is in turn adapted to be connected to the vessel, a seal unit having upper and lower shafts extending therefrom, the upper seal unit shaft being connected to the connector at the bottom end of the agitator shaft within the vessel and extending through a flanged opening in the vessel, the seal unit being positioned outside the vessel and connected to the flanged opening in the vessel and a coupling shaft connected to the lower seal unit shaft and to a rotary drive means, wherein the seal unit is removed by removing the coupling shaft from the assembly, disconnecting the seal unit from the flanged opening of the vessel, lowering the seal unit, agitator shaft and agitator connected thereto whereby the connection between the upper seal unit shaft and the agitator shaft is moved to a position outside the vessel, connecting the support collar to the connector at the bottom end of the agitator shaft, raising the seal unit, agitator shaft and agitator whereby the support collar is positioned adjacent the vessel, connecting the support collar to the vessel and then disconnecting the upper seal unit shaft from the agitator shaft whereby the seal unit is removed from the assembly and wherein a seal unit is reinstalled by carrying out the above steps in reverse order, the improvement which comprises:

removably installing a first pair of elongated horizontally positioned parallel rails beneath said vessel, one on each side of said coupling shaft with a selectively elevatable table movably mounted thereon;

utilizing said elevatable table in the lowering and raising of said seal units during the removal and reinstallation thereof and in the movement of said seal unit between said assembly and one end of said rails; and then

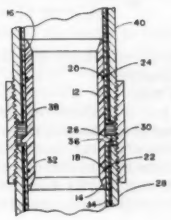
removing said rails and elevatable table from beneath said vessel.

4,507,842

METHOD OF SEALING AND PROTECTING A PLASTIC LINED PIPE JOINT

John Werner, Box 14, Independence, Kans. 67301

Filed Aug. 19, 1983, Ser. No. 524,760
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—451 **1 Claim**



1. An improved method for sealing and protecting a plastic lined pipe joint from corrosive fluid passing through the plastic lined pipe comprising the steps of:

(a) providing a first and second section of plastic lined pipe having externally threaded ends such that an internally threaded collar can be employed to form the pipe joint holding said pipe segments together;

(b) threading an internally threaded collar onto one end of the first of said plastic lined pipe sections;

(c) providing a hollow, open ended, cylindrical plastic collar seal presized to concentrically fit within the plastic liner of said sections of plastic lined pipe with minimum concentric tolerance and wherein said open ends of said plastic collar seal are internally beveled and wherein said plastic collar seal is equipped with external O-ring grooves and O-rings at each of said ends and wherein said collar seal is further provided with an external ledge means molded concentrically to said collar seal between said O-rings, and wherein said ledge means is adapted to fit within said internally threaded collar and rest on the end of said lined pipe and wherein said ledge means is positioned such that the distance from at least one end of said collar seal to the ledge means exceeds the length of said internally threaded collar;

(d) placing said plastic collar seal within said plastic lined pipe and threaded collar such that one end of said collar seal extends out of said collar threaded on said first section of plastic lined pipe and said ledge means rests on the end of said first section of plastic lined pipe; and

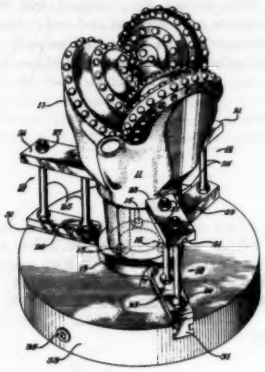
(e) threading said second section of plastic lined pipe into said internally threaded collar thus forming a tight pipe joint with said collar seal within said joint.

4,507,843

CLAMPING ASSEMBLY

Gerald O. Atkinson, Pasadena, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 10, 1982, Ser. No. 448,671
Int. Cl.³ B23B 31/16; B23K 9/00
U.S. Cl. 29—466 5 Claims



4. A method for securing a rock bit section during welding, comprising the steps of:

providing a base;

attaching a pair of resilient rods at one end to the base;

attaching engaging means to the rods to form a rectangular structure for engaging the rock bit section; and

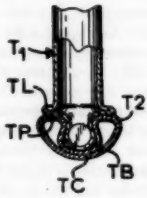
moving the base toward the rock bit section until the engaging means engages the rock bit section, deforming the rectangular structure to a generally parallelogram configuration.

4,507,844

T-ASSEMBLY AND METHOD OF OBTAINING SAME

Maurice Renaud, 66 Chemin des Bretoux, 95320 Saint Leu la Foret, France, assignor to Maurice Renaud, France

Filed Sep. 17, 1981, Ser. No. 303,038
Claims priority, application France, Oct. 6, 1980, 80 21307; Jun. 30, 1981, 81 12817
Int. Cl.³ B23P 11/02
U.S. Cl. 29—522 R 4 Claims



1. A method of assembling two tubes to form a T-assembly which rigidly interconnects the two tubes, comprising the steps of: initially deforming a first wall portion of a first hollow cylindrical tube laterally toward a diametrically opposed wall portion of said first tube, said diametrically opposed wall portion being sufficiently supported during deformation of said first wall portion to maintain the shape of said diametrically opposed wall portion; said first wall portion being deformed along a generally linear portion thereof in a direction parallel to the longitudinal axis of said first tube thereby forming an elongated groove; during forming of said elongated groove, said first wall portion being deformed without breaking continuity thereof into a shape conforming to and in contact with an interior surface of said diametrically opposed wall portion along a predetermined distance; said predetermined distance being sufficiently less than one-half the circumferential length of said first hollow cylindrical tube that a neck is formed by regions adjacent said first wall portion of said first hollow cylindrical tube on either side thereof, said neck being formed to have a predetermined minimum width which is sufficiently less than said predetermined distance of contact so as to form a generally dove-tail shape with neck walls being sufficiently spaced away from any other tube wall surfaces to enable said neck walls to be resiliently flexed away from one another without permanent deformation of said neck during forcible insertion through said neck of a tongue having a predetermined maximum width sufficiently large to cause separation of said neck walls during insertion of said tongue member between said neck walls;

said tongue member being formed by deforming opposing side wall portions of a free end of a second hollow cylindrical tube toward one another without breaking continuity of said wall portions to form a pair of generally linear lips having a predetermined length; said lips being connected together at either edge thereof by portions of said second hollow cylindrical tube, said lips being adapted to be received in said elongated groove; said lips being spaced apart a predetermined distance at said free end of said second hollow cylindrical tube, said lips extending axially along said second hollow cylindrical tube a predetermined distance approximately equal to a depth of said elongated groove as measured from said neck to said first wall portion in contact with said interior surface; said lips converging toward one another generally smoothly axially along said predetermined distance approximately equal to said depth of said elongated groove and then diverging generally smoothly to an undeformed portion of said second hollow cylindrical tube; said lips having a predetermined minimum width generally equal to said predetermined minimum width of said neck of said groove in said first hollow cylindrical tube; and placing a rod in said groove, said rod having a predetermined diameter larger than said predetermined spacing of said lips at said end of said second hollow cylindrical tube; said rod being sufficiently strong to deform said lips apart when sufficient force is applied between said rod and said lips; said rod having an axial length less than said predetermined length of said lips so that said lips, upon application of sufficient axial force along said second hollow cylindrical tube against said groove can be deformed about said rod;

orienting a longitudinal axis of said second hollow cylindrical tube generally perpendicularly to a longitudinal axis of said first hollow cylindrical tube; inserting said lips at said free end of said second hollow cylindrical tube into said groove by application of sufficient force to urge said second hollow cylindrical tube along said longitudinal axis of said second hollow cylindrical tube toward said groove until said lips deform said neck walls outwardly and pass to penetrate into said groove to meet said rod; and applying sufficient force to said second tube along its said longitudinal axis to deform said lips outwardly against said rod; said lips being deformed outwardly such that said lips are spaced apart a greater distance than said neck, interior surfaces of said lips being in mating contact with said rod, and exterior surfaces of said lips being in mating engagement with said neck walls and being in contact with said first wall portion at a base of said groove; said neck walls resiliently returning toward said predetermined minimum width, such that said lips and said groove form a strong joint.

4,507,845

METHOD OF MAKING FIELD EFFECT TRANSISTORS WITH OPPOSED SOURCE AND GATE REGIONS

George W. McIver, Redondo Beach; Kenichi Nakano, North Hollywood, and John J. Berenz, Lawndale, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sep. 12, 1983, Ser. No. 531,548
Int. Cl.[3] H01L *29/80, 21/283*
U.S. Cl. 29—571 9 Claims

1. A method for fabricating a field-effect transistor (FET) capable of operation at extremely high frequencies, said method comprising the steps of:

forming a semiconductor channel region on a first face of a substrate;

forming a via hole from the opposite face of the substrate;

metalizing the via hole to form an FET source;

determining the location of the source from a back-scattered electron image obtained by scanning the first face of the substrate with an electron beam;

forming drain areas on the channel region; and

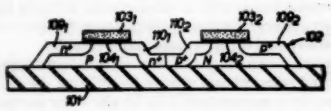
forming a gate on the channel region opposite the FET source.

4,507,846

METHOD FOR MAKING COMPLEMENTARY MOS SEMICONDUCTOR DEVICES

Junichi Ohno, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 20, 1983, Ser. No. 543,971
Claims priority, application Japan, Oct. 27, 1982, 57-188620
Int. Cl.[3] H01L *21/265*
U.S. Cl. 29—571 7 Claims



1. A process for making a complementary metal oxide semiconductor (CMOS) with a high impurity density contact region between elements at a boundary between respective drain regions of a p-channel metal oxide semiconductor (MOS) transistor and an n-channel MOS transistor comprising:

forming at least two gate electrodes over an oxide layer on a semiconductive layer;

removing a portion of the semiconductive layer between the gate electrodes so that the thickness of the portion of the semiconductive layer between the gate electrodes is less than that of the semiconductor layer under the gate electrodes; and

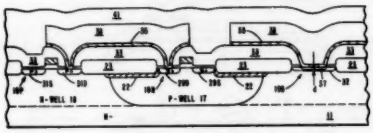
doping n type and p type impurities in respective predetermined portions of the semiconductive layer to form drain and source regions for the respective n-channel and p-channel MOS transistors constructed using the gate electrodes as masks so that the respective drain regions extend to the substrate under where said portion of the semiconductor layer was removed.

4,507,847

METHOD OF MAKING CMOS BY TWIN-TUB PROCESS INTEGRATED WITH A VERTICAL BIPOLAR TRANSISTOR

Paul A. Sullivan, Fort Collins, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 22, 1982, Ser. No. 391,068
Int. Cl.[3] H01L *21/265;* B01J *17/00*
U.S. Cl. 29—576 B 6 Claims



1. A process for forming complementary metal oxide semiconductor devices and vertical bipolar junction transistors in the same wafer comprising:

forming opposite conductivity-type, n-type and p-type, surface-adjacent regions in the wafer;

forming an isolation oxide on the wafer to define locations for n-channel, p-channel and bipolar transistor devices;

forming self-aligned, silicon gate, n-channel and p-channel MOS devices within the opposite conductivity-type, surface-adjacent regions of the wafer;

forming a bipolar junction transistor base of one conductivity type in a surface-adjacent region of opposite conductivity type by imparting a low dose, blanket implant to the wafer, the dose being less than 10% of that of the implant dose used for the source and drain regions of the MOS devices;

forming on the wafer an interlayer dielectric layer having openings to selected contact regions including a defined emitter window over the bipolar junction transistor base and including openings to the doped substrate regions associated with the MOS devices;

forming a silicon layer on the wafer of 0.05 microns to 0.5 microns thickness, the layer making contact with the selected contact regions and the contact area thereof with the base delineating an emitter region of the bipolar junction transistor;

selectively implanting with a dopant, of opposite conductivity type to that of the base region, the contact-associated regions of the emitter and selected underlying contact regions of the same conductivity type as the emitter;

diffusing the base and emitter regions to predetermined junction depths;

depositing a layer of metal on the silicon;

selectively patterning the dual-layer of metal-silicon to form interconnections therefrom; and

forming a passivation layer over the wafer.

4,507,848

CONTROL OF SUBSTRATE INJECTION IN LATERAL BIPOLAR TRANSISTORS

Peter R. Smith, San Jose, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Nov. 22, 1982, Ser. No. 443,846
Int. Cl.[3] H01L *21/265, 21/74*
U.S. Cl. 29—576 B 9 Claims

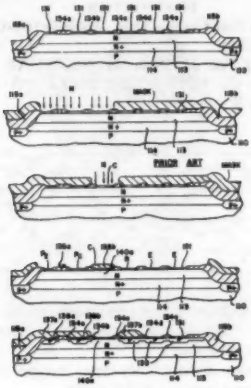
1. A method for fabricating a semiconductor structure which reduces vertical current injection from lateral bipolar transistors formed in said structure, said method comprising:

(a) forming a buried layer of a first conductivity type in a selected region of a semiconductor substrate of a second

conductivity type, the second conductivity type being opposite the first conductivity type,

(b) forming an epitaxial layer of the first conductivity type such that at least a portion of the epitaxial layer overlies the buried layer,

(c) forming isolation oxide regions in said epitaxial layer



which regions extend to the substrate to define an electrically isolated island of epitaxial material,

(d) introducing a selected impurity of the first conductivity type into substantially the entire portion of the epitaxial layer beneath a to-be-formed lateral bipolar transistor, and

(e) forming the lateral bipolar transistor in the epitaxial layer.

4,507,849

METHOD OF MAKING ISOLATION GROOVES BY OVER-FILLING WITH POLYCRYSTALLINE SILICON HAVING A DIFFERENCE IN IMPURITY CONCENTRATION INSIDE THE GROOVES FOLLOWED BY ETCHING OFF THE OVERFILL BASED UPON THIS DIFFERENCE

Satoshi Shinozaki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 285,507, Jul. 21, 1981, abandoned. This application Jun. 24, 1983, Ser. No. 507,557

Claims priority, application Japan, Jul. 28, 1980, 55-103341; Dec. 12, 1980, 55-175292; Dec. 12, 1980, 55-175293; Mar. 5, 1981, 56-31602

Int. Cl.[3] **H01L** *21/20, 21/306*

U.S. Cl. 29—576 W **18 Claims**

1. A method of manufacturing a semiconductor circuit comprising the steps in the order mentioned below of:

(a) forming a groove on one main surface of a semiconductor substrate such that an island region is defined by said groove;

(b) oxidizing said main surface of said substrate including at least the surface of said groove to form an oxide film;

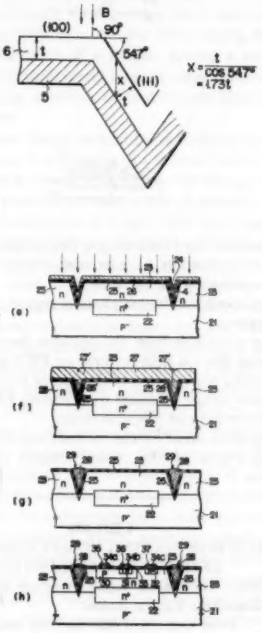
(c) depositing a first semiconductor layer on said oxide film formed in step (b);

(d) implanting an impurity by ion implantation such that said first semiconductor layer within said groove alone is doped with said impurity, thereby creating a difference between the impurity concentration of said first semiconductor layer within said groove and the impurity concentration of said first semiconductor layer above and adjacent said groove, said implanting being accomplished by use of an ion implantation voltage such that said impurity remains in said first semiconductor layer within said groove alone and passes through said first semiconductor layer above and adjacent said groove;

(e) heating said first semiconductor layer;

(f) selectively removing the first semiconductor layer above and adjacent said groove by utilizing said difference in impurity concentration;

(g) depositing a second semiconductor layer over said first semiconductor layer in said groove and on the substrate surface adjacent said groove, said second semiconductor layer being deposited to a depth greater than the depth of said groove so that at the location of said groove said second semiconductor layer fills said groove and extends above the main surface of said substrate;



(h) introducing said impurity from said first semiconductor layer into said second semiconductor layer whereby the impurity concentration of said second semiconductor layer within the groove is substantially different from the impurity concentration of said second semiconductor layer above and adjacent said groove; and

(i) selectively removing said second semiconductor layer above and adjacent said groove by utilizing the difference in impurity concentration so as to allow the second semiconductor layer to remain only within the groove and, thus, to provide a region for separating two adjacent island regions.

4,507,850

BORING BAR ADJUSTING APPARATUS

Ervin J. Kielma, West Allis, Wis., assignor to Kearney & Trecker Corporation, Milwaukee, Wis.

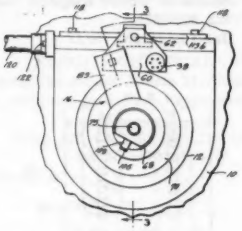
Filed Dec. 19, 1983, Ser. No. 563,110

Int. Cl.[3] **B23Q** *3/157, 15/22*

U.S. Cl. 29—568 **3 Claims**

1. In a boring bar adjusting mechanism for a machine tool that is controlled by a numerical control circuit and which is provided with a rotary spindle for receiving cutters and operating them in a machining operation; mounting means in said spindle for receiving cutters and securing them for the performance of a machining operation; a measuring instrument adapted to be received by said mounting means; positioning

means for positioning said measuring instrument in the bore of a workpiece while said measuring instrument is carried by the spindle; means in said measuring instrument adapted to produce a signal representing the diameter of the bore, a connector mounted on said measuring instrument and electrically connected thereto for supplying energy and for receiving said signal, a yoke movably mounted on the machine tool, a jack carried by said yoke and electrically connected to the numerical control circuit of the machine; shifting means for shifting said yoke for coupling said jack to said connector for electrically connecting said measuring instrument to the numerical control circuit, recording means in the numerical control circuit for reducing said signal; a boring bar adapted to be received by said mounting means in said spindle for performing a machining operation; a cutting element mounted in said boring bar for performing cutting operations; adjusting means in said boring bar for adjusting the position of said cutting element in said boring bar to vary the diameter of the bore produced by the operation of the boring bar, an actuator carried by said bore bar and connected to actuate said adjusting mechanism; a driver carried by said yoke in position to move with said yoke into and out of engagement with said actuator; and power means connected to operate said driver for actuating said adjusting mechanism through said actuator, said power means being regulated by said numerical control circuit for operation in response to said signal for precisely setting said cutting element to cut the desired diameter bore.

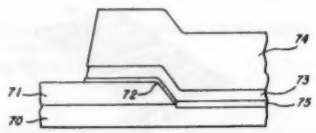


4,507,851

PROCESS FOR FORMING AN ELECTRICAL INTERCONNECTION SYSTEM ON A SEMICONDUCTOR

Keith A. Joyner, Richardson, and Ronald B. Foster, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 30, 1982, Ser. No. 373,778
Int. Cl.³ C23C 15/00; H01L 21/443
U.S. Cl. 29—590 **4 Claims**



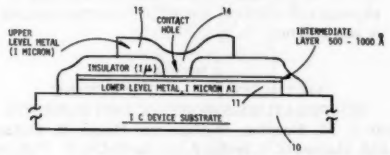
1. A process for forming an electrical interconnection system on a semiconductor comprising the steps of:
   a. providing a silicon substrate;
   b. forming on the surface of said substrate, a layer of silicon dioxide or silicon nitride;
   c. defining contact openings on said substrate through said oxide or said nitride;
   d. sputter etching to remove a surface layer from the silicon oxide or nitride and the silicon substrate;
   e. depositing a layer of platinum over the entire semiconductor surface including the oxide or nitride;
   f. depositing a layer of barrier metal on said platinum layer;
   g. depositing a layer of conducting metal on said barrier metal layer;
   h. defining said metal interconnection system;
   i. heating the substrate for annealing and to form platinum silicide in the contact openings.

4,507,852

METHOD FOR MAKING A RELIABLE OHMIC CONTACT BETWEEN TWO LAYERS OF INTEGRATED CIRCUIT METALLIZATIONS

Pramod C. Karulkar, Diamond Bar, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 12, 1983, Ser. No. 531,529
Int. Cl.³ H01L 21/90
U.S. Cl. 29—590 **2 Claims**


UPPER LEVEL METAL (1 MICRON)
CONTACT HOLE
INTERMEDIATE LAYER 500 - 1000 Å
INSULATOR (1 μ)
LOWER LEVEL METAL, 1 MICRON Al
I C DEVICE SUBSTRATE

1. A method of fabricating a semiconductor integrated circuit comprising the steps of:
   providing a semiconductor body having a major surface;
   depositing a first aluminum layer on said major surface of said semiconductor body;
   depositing a layer of a refractory silicide selected from the group of silicides of tungsten, titanium, tantalum, and molybdenum on said first layer of conductive material;
   masking portions of said refractory silicide layer to define a first pattern thereon;
   etching said silicide layer down to said first aluminum layer in order to produce the pattern defined by said masking step;
   masking portions of said body to define a second pattern thereon;
   etching said first aluminum layer in said second masking pattern;
   sintering the semiconductor body to stabilize the contact between said first aluminum layer and said layer of refractory silicide;
   depositing a layer of dielectric material on said body;
   masking portions of said dielectric material to define a third pattern thereon;
   etching through said dielectric material to said silicide layer in accordance with the third pattern;
   depositing a second aluminum layer on said body; and
   sintering said body in order to stabilize the contact between said second conductive layer and said silicide layer.

4,507,853

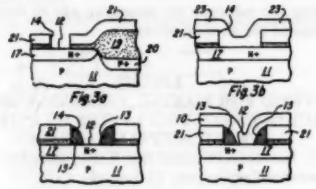
METALLIZATION PROCESS FOR INTEGRATED CIRCUITS

James M. McDavid, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 23, 1982, Ser. No. 410,755
Int. Cl.³ H01L 21/285
U.S. Cl. 29—591 **10 Claims**

1. A method of making contact to a face of a semiconductor body through an aperture in an insulating layer on said face, comprising the steps of:
   (a) depositing a layer of conductive material on said face to cover the semiconductor body within said aperture and also to cover the insulating layer and the sidewalls of the aperture,

(b) selectively removing said layer of conductive material from said face over said insulating layer but leaving said layer in place on said sidewalls,



(c) thereafter depositing additional conductive material on said face to extend continuously from above the insulator and down the sidewall into the aperture and to make physical and electrical contact to the semiconductor body in said aperture.

4,507,854

METHOD OF MANUFACTURING TEMPERATURE-SENSITIVE INSTRUMENTS

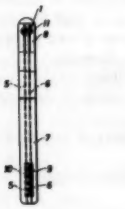
Ingvar J. M. Hansson, Staffanstorp; Hakan B. Hakansson, Lund; Magnus G. K. Igefjord, and Berth-Ove G. Wall, both of Bjärred, all of Sweden, assignors to Gambro Crafon AB, Sweden

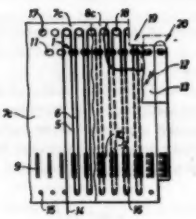
Division of Ser. No. 196,079, filed as a PCT SE 79/00018, Jan. 25, 1979, published as WO 80/01608, Aug. 7, 1980, § 102(e) date Jun. 1, 1979, Pat. No. 4,382,246.

This application Dec. 6, 1982, Ser. No. 447,176

Int. Cl.³ H01C *7/00*

U.S. Cl. 29—612 **11 Claims**





1. A method of manufacturing temperature-sensitive instruments, comprising the steps of:

supplying first and second webs of insulated material in synchronism with each other to a work station, said first web having a series of first holes formed therein offset from a series of second holes formed in said second web;

disposing a conductor transversely between said first and second webs such that said conductor forms pairs of conducting lines, one line of each pair being in register with a corresponding one of said first holes and the other line of each pair being in register with a corresponding one of said second holes;

connecting a temperature-sensitive sensor to each of said pairs of conducting lines; and

cutting said first and second webs at spaced intervals between adjacent pairs of conducting lines to form a plurality of temperature-sensitive instruments.

4,507,855

LEAD ACID ELECTRIC STORAGE CELL AND A POSITIVE ELECTRODE THEREFOR

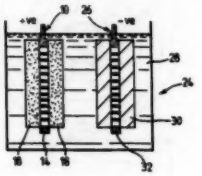
Patrick T. Moseley, Chilton, and Nevill J. Bridger, Hermitage, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 22, 1983, Ser. No. 477,776

Claims priority, application United Kingdom, Aug. 6, 1982, 8222739; Dec. 20, 1982, 8236203

Int. Cl.³ H01M *10/12*

U.S. Cl. 29—623.1 **17 Claims**



1. A method of making a charged lead acid electric storage cell comprising the steps of

(i) making a first electrode by chemically preparing particulate beta lead dioxide and supporting the beta lead dioxide with a carrier;

(ii) making a second electrode by compacting fine lead metal about a carrier therefor;

(iii) assembling a charged lead acid electric storage cell comprising a positive electrode constituted by said first electrode, a negative electrode constituted by said second electrode, and an electrolyte for the cell.

4,507,856

METHOD OF ASSEMBLING MULTICELL ELECTRIC STORAGE BATTERIES

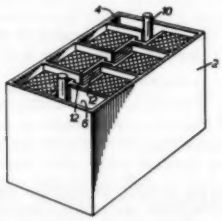
Ernest J. Pearson, Swinton, England, assignor to Chloride Group Public Limited Company, London, England

Filed Oct. 31, 1983, Ser. No. 547,234

Claims priority, application United Kingdom, Oct. 29, 1982, 8230958

Int. Cl.³ H01M *6/00*

U.S. Cl. 29—623.1 **37 Claims**



1. A method of assembling a multicell electric storage battery having a plurality of cells, including two electrical end cells, electrically connected in series with each plate in each cell being substantially coplanar with one plate in every other cell comprising forming a laminated structure from a plurality of superposed substantially planar plate arrays, each array comprising both positive and negative plates and each plate

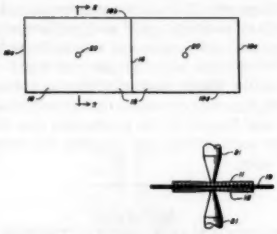
being connected to at least one further plate in the same array by at least one link, the arrays being superposed in the laminated structure so that the plates of each array are in registry with those in each adjacent array and the superposed plates of adjacent arrays are of opposite polarity and separated by a separator material, and severing selected links to thereby form a battery element having a plurality of stacks of plates of alternating polarity, which stacks constitute the individual cells of the battery element and in which each plate, with the exception of every other plate in the stack of plates in the two electrical end cells, is electrically connected by an unsevered link to only a plate of opposite polarity in the same array, whereby the unsevered links connect the cells in series in the finished battery, and every alternate plate in the stacks of plates in the two electrical end cells is connected to no other plate.

4,507,857

ELECTROCHEMICAL CELL

James Epstein, Sharon, and Nikola Marincic, Winchester, both of Mass., assignors to Battery Engineering Inc., Hyde Park, Mass.

Filed Jun. 22, 1983, Ser. No. 506,786
Int. Cl.³ H01M 6/04
U.S. Cl. 29—623.2 **7 Claims**



1. A method for assemblying an electrochemical cell comprising the steps of

(a) forming a pair of through-holes in a sheet of thin resilient non-metallic material;

(b) placing each through-hole between a respective pair of overlying electrically conductive members;

(c) sealing the members of each pair of conductive members to the non-metallic material surrounding the through-hole;

(d) electrically coupling the members of each pair through the interjacent through-hole;

(e) electrically coupling an anode and a cathode respectively to the electrically conductive member of a different member pair on one side of the non-metallic sheet;

(f) forming the non-metallic material into a pouch;

(g) providing for minimal separation of the anode and cathode;

(h) adding electrolyte in electrochemical contact with the anode and cathode; and

(i) sealing the pouch.

4,507,858

APPARATUS FOR MAKING AN ELECTRICAL CONTACT

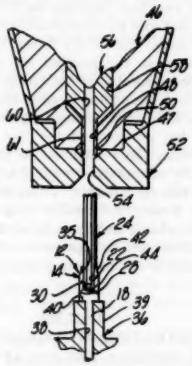
Leroy W. Fairbairn, Sidney, and Clifford R. Waldron, Niverville, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 324,714, Nov. 24, 1981, Pat. No. 4,433,482, which is a continuation of Ser. No. 84,959, Nov. 15, 1979, abandoned. This application Oct. 24, 1983, Ser. No. 544,349
Int. Cl.³ B23P 19/00
U.S. Cl. 29—747 **3 Claims**

1. In an apparatus for simultaneously forming a radial collar medially of an axial electrical contact of the type having a forward portion and a rearward portion coaxially disposed, the apparatus characterized by:

a generally cylindrical male member having an action surface and a cylindrical hole extending inwardly from the action surface, said hole being sized to receive said rearward portion so that said forward portion extends forwardly of the action surface;

a receiving member including a collar portion having a generally cylindrical aperture extending axially inward from a face thereof, said aperture being sized to receive the forward portion and having a diameter slightly less than a dimension defining the outer cross-section of said forward portion, said receiving member being disposed in



spaced apart relation to said male member, the axis of said hole being generally coaxial with the axis of said aperture and one of said members being adapted to be moved axially towards the other of said members; and

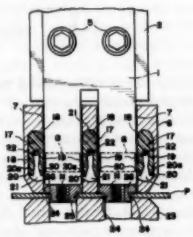
means for positioning said members so that said hole and said aperture have their axes coaxially aligned whereby as the male member is moved towards the receiving member, said forward portion advances into the aperture, whereupon the walls defining the aperture engage the forward portion of the contact, further advance of the members squeezing some of the outer wall of the forward portion radially inward and pushing other of the outer wall axially rearward and radially outward to form a medial collar.

4,507,859

SELF-PIERCING NUT HOLDING DEVICE

Katsumi Shinjo, Osaka, Japan, assignor to VE-Wissenschaftlich-Technischer Betrieb Keramik, Meissen, German Democratic Rep.

Filed Feb. 24, 1983, Ser. No. 469,485
Claims priority, application Japan, Mar. 4, 1982, 57-30928[U]
Int. Cl.³ B23P 10/00, 11/00
U.S. Cl. 29—798 **5 Claims**



1. A nut holding device adapted to be attached to an assembling machine for consecutively receiving and holding nuts therein to apply the nuts to work pieces by means of the assembling machine, comprising;

a nut holder having at least one passageway to allow the assembling machine to reciprocatingly move therethrough, a nut delivery hole communicating with the passageway to deliver the nuts to the passageway one by one, at least two recesses situated along two opposed sides of the passageway and extending beyond the nut delivery hole, and at least two pins situated inside the recesses parallel to the opposed sides of the passageway, and

at least two elastic members situated in the recesses of the nut holder, each elastic member including a body portion, two leg portions extending from the body portion parallel to each other, a crotch portion between the two leg portions, and two foot portions at forward ends of the leg portions, said foot portions having bent corners and being slighly oriented outwardly from the bent corners to incline relative to the parallel leg portions, each elastic member being located in the recess and supported by the pin situated at the crotch portion thereof so that when the nut is disposed in the passageway outside the nut delivery hole, the leg portions of the two elastic members are located substantially adjacent to the nut and the nut is substantially supported by the foot portions of the two elastic members, whereby when the nut is pushed outwardly by means of the assembling machine, the leg portions of the elastic members bend toward the recesses to thereby allow the nut to move out of the passageway without selectively imparting stress to the elastic members.

4,507,860

PRODUCTION LINE FOR GRAPHITE NIPPLES

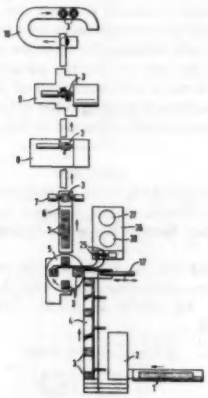
Adolf Sigmund, Meitingen, Fed. Rep. of Germany, assignor to Sigri Elektrographit GmbH, Meitingen bei Augsburg, Fed. Rep. of Germany

Filed Dec. 2, 1982, Ser. No. 446,252

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1981, 3147793

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—825 **10 Claims**



1. Production line for manufacturing tapered thread nipples of cylindrical graphite sections, through which the graphite sections are moved, comprising a support means, cutting means located on said support means for cutting to length a graphite rod into cylindrical graphite sections, means on said support means located downstream from said cutting means, for facing off a curved surface layer of each of the graphite sections for cutting free binder filled holes, drilling means located on said support means and downstream from said facing off means to form storage holes in the graphite section, thermoplastic binder means located on said support means and operatively connected to said storage holes for filling the storage holes with thermoplastic binder, and threading means located downstream from said thermoplastic binder means for forming a screw thread in the surface of the graphite section, in combination with a rotary-cycle machine located on said support and having a plurality of stations and a turntable rotatable at a predetermined rate movable from one station to another station, prismatic guides radially connected to the turntable for receiving the graphite sections and respective stops movable in the radial direction of said turntable, a push rod located on said support means and operatively associated with a first station of said rotary-cycle machine, said rod periodically acting in the radial direction of said machine to transfer a graphite section onto one of the prismatic guides at the first station, clamping levers linked to the turntable to act on graphite sections supported in the prismatic guides in a region of a second station and a third station of said machine, a boring mill supported on said support means and operatively associated with the second station, said boring mill having at least two drilling spindles which can be moved relative to one another and can be moved in a vertical direction for drilling blind holes into the graphite sections, at least two filling nozzles supported on said support means and located above a third station of said machine, movable relative to each other and in a vertical direction for filling the blind holes with the binder each of said nozzles being connectable to a heatable pipe line with said pipe line being controllable by a control dosing pump with said dosing pump being operatively associated with a heatable binder supply tank, a tie rod supported on said support means and operatively associated with a fourth station of said machine which periodically engages said fourth and is movable in the radial direction of said machine to remove the graphite section from the prismatic guide at the fourth station of the turntable, a turning means supported on support means operatively associated with said machine and located in the production line after removal of the graphite section from the turntable for cutting free the binder filled holes.

4,507,861

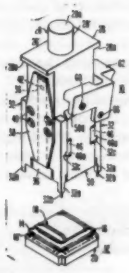
INSERTION DEVICE FOR AN ELECTRONIC CIRCUIT PACKAGE ASSEMBLY

George J. Sprenkle, Phoenixville, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 12, 1983, Ser. No. 560,864

Int. Cl.³ H05K *3/30, 13/04*

U.S. Cl. 29—741 **10 Claims**



1. A tool for receiving an electronic circuit package assembly which includes a lead-type package and a multi-apertured block for protecting the package leads, and for inserting said leads into a printed circuit board, comprising:

a body member of substantially rectangular cross section and having a central longitudinal aperture therein,

a pair of side plates immovably affixed to a respective first pair of opposite sides of said body member and extending longitudinally therebeyond, said side plates having respective longitudinal grooves therein, a pair of ejector rods slidably disposed in said grooves,

a shaft slidably disposed in said aperture of said body member, a coaxial spring member situated in said aperture and enclosing a portion of said shaft, means coupling said ejector rods to said shaft,

a generally "H" shaped support member immovably affixed between said plates, a pair of substantially planar gripper members pivotably coupled to said support member and disposed adjacent the respective second pair of opposite sides of said support member, said gripper members having respective jaw-like sections at the extremities thereof, said jaw-like sections being normally biased to a closed condition, means for opening said jaw-like sections whereby said tool is preset to receive said package assembly, means coupled to said support member and responsive to contact with said package assembly for causing said jaw-like sections to close upon opposed edges of said lead-type package,

the application of an external force to said shaft in the direction of said package assembly causing movement of said shaft in opposition to said coaxial spring member and concomitant movement of said ejector rods, the latter removing said multi-apertured block from said package leads in preparation for the insertion of the latter into said printed circuit board.

4,507,862

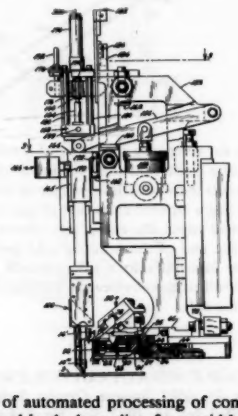
METHOD AND APPARATUS FOR HIGH SPEED TRANSFER AND INSERTION OF ELECTRICAL COMPONENTS

John A. Kukowski, Johnson City, N.Y.; Henry J. Soth, Brackney, Pa., and William H. Gay, Endicott, N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,727

Int. Cl.[3] **H05K** *3/30;* **B23P** *19/00;* **B65H** *1/00;* **B65G** *00/00*

U.S. Cl. 29—837 **14 Claims**



1. A method of automated processing of components each having a body and leads depending from said body, said processing comprising transferring individual components sequentially from an unload station to a load station for subsequent populating of a circuit board by inserting said leads into holes of a circuit board with an inserter, said method for each component comprising the steps of:

presenting said component to said unload station by a clip means for releasably holding said component by leads at said unload station, at least two of said leads being generally parallel and generally defining a lead plane;

clamping at least two of said leads at said unload station by a loader during holding of said leads by said holding means;

transferring said loader in a direction generally perpendicular to said lead plane during said clamping to effect releasing of said leads and unloading of said component from said holding means and presenting of said component to said load station;

engaging at least two of said leads with said inserter at said load station during clamping of said leads by said loader; and

unclamping said leads while driving at least two of said leads into an interference fit with said inserter to effect loading of said inserter.

8. An apparatus for automated processing of electrical components, each of said components having a body and leads depending from said body, said processing comprising transferring individual components sequentially from an unload station to a load station for subsequent populating of a circuit board by inserting said leads into holes of a circuit board with an inserter, said apparatus comprising:

clip means for presenting each component to said unload station and releasably holding said component by at least two of said leads at said unload station, at least two of said leads being generally parallel and generally defining a lead plane;

loader means, operatively associated with said presenting means, for clamping at least two of said leads at said unload station during holding of said leads by said presenting means;

transfer means, operatively associated with said loader means, for transferring said loader means in a direction generally perpendicular to said lead plane, during said clamping, in order to effect releasing of said leads and unloading of said component from said presenting means and presenting of said component to said load station;

means, operatively associated with said loader means, for engaging at least two of said leads with said inserter at said load station during clamping of said leads by said loader means; and

means, operatively associated with said loader means, for unclamping said leads and driving said leads into an interference fit with said inserter to effect loading of said inserter.

4,507,863

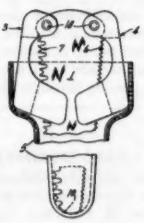
PACKSAW

Jerry D. Rowe, P.O. Box 733, Dubois, Wyo. 82513

Filed Aug. 12, 1982, Ser. No. 407,639

Int. Cl.[3] **B27B** *21/00*

U.S. Cl. 30—166 R **5 Claims**



1. A packsaw adapted to be housed in an open top protective carrying sheath comprising an elongated blade having teeth extended at least along one edge, a multiple part handle secured to one end of said blade, said handle including first and second handle members, each of said handle member being similarly formed and having a first end pivotally secured to the blade and movable between an extended position defining an operating handle, each of said handle members having an outer end enlargement portion which extends laterally outwardly and in the extended position of said handle members defines a substantially T-shaped hand-gripping portion, each of said outer end enlargement portions having outer edge slots adapted to telescope over said blade and thereby provide for pivoting of the handle members onto the adjacent end of said blade in a storage position, each of said handle members being substantially shorter than said blade and thereby telescoped over substantially less than one-half the blade for protecting

the exposed end portion when in said storage position for location in said sheath.

4,507,864

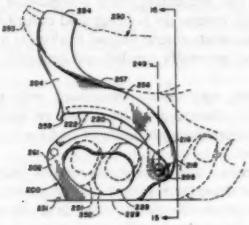
CUTTING SHEARS

Martin N. Leibowitz, 1155 Hillsboro Mile, Suite 602, Hillsboro Beach, Fla. 33062

Continuation-in-part of Ser. No. 392,958, Jun. 28, 1982, abandoned. This application Jul. 30, 1982, Ser. No. 403,294

Int. Cl.³ B26B *13/06, 17/02, 13/20, 13/12*

U.S. Cl. 30—248 **6 Claims**



1. Manicuring scissors and the like comprising a pair of pivotally connected blade members, each of said blade members including means forming a cutting edge cooperable with the cutting edge of the other blade member for cutting fingernails and the like, one of said blade members including means forming a flat support surface thereon for supporting said scissors on a surface, said blade members each including handle means adapted to be engaged by at least one finger and the thumb ot a hand, respectively, said handle means of said one blade member comprising an opening formed in said one blade member for receiving at least the index and middle fingers of said hand, said handle means of the other blade member including a support pad portion and a stirrup for receiving the thumb of said hand and disposed directly above said one blade member for actuating said blade members between blade open and closed positions when said one blade member is supported by said support surface on a horizontal surface, said handle means being arranged such that at least in the closed position of said scissors wherein said cutting edges lie ajacent to each other said blade members and said handle means lie substantially in a quadrant in a place perpendicular to the pivot axis of said blade member, said quadrant being delimited by a first line coincident with said support surface and a second line perpendicular to said first line and passing through said pivot axis.

4,507,865

GRASS TRIMMER

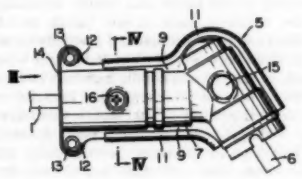
Hisashi Inaga, Tokyo, and Kozi Ohtagawa, Hachioji, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 553,652

Claims priority, application Japan, Dec. 16, 1982, 57-189219[U]

Int. Cl.³ A01D *55/18*

U.S. Cl. 30—276 **1 Claim**



1. A grass trimmer having an elongated operation rod, a prime mover mounted on one end of said operation rod, a transmission shaft extended through said operation rod, a gear box connected at its one end to the other end of said operation rod, and a cutting blade member connected to a blade driving shaft projected from the other end of said gear box, said transmission shaft and said blade driving shaft being drivingly connected to each other through gears within said gear box, wherein the improvement comprises that said gear box **5** is composed of a plurality of steel sheets **7,8** which are shaped beforehand to define, when assembled together, a hollow **17** of a circular cross-section and to have longitudinal flanges **9,9** and **10,10**, said steel sheets being jointed to each other to form said gear box in one body by hemming along said flanges **9,9** and **10,10** such that said flanges **9,9** and **10,10** are superposed and folded back one on the other to form fold-back portions **11,11** along the length of the gear box.

4,507,866

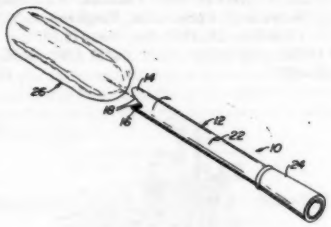
DEVICE FOR REMOVING PORTION OF A ROLL AND METHOD OF USING SAME

Paul Rimmeir, The Claridge, 201 S. 18th St., Apt. 2219, Philadelphia, Pa. 19103

Filed Apr. 21, 1983, Ser. No. 487,438

Int. Cl.³ B26B *3/00, 3/04*

U.S. Cl. 30—316 **5 Claims**



1. A device for removing a portion of a roll, comprising an elongated tubular shaft, said shaft having a free end including at least one notch therein defining a pair of spaced jaws, each of said jaws being a tapered extension of said tubular shaft and having sharpened edges, the end of one of said jaws projecting forwardly of the end of the other of said jaws whereby said device may be inserted into a roll, rotated, and tilted with respect to said roll to thereby sever a portion of the interior of the roll from the roll.

4,507,867

CABLE SHEATH CUTTER KNIFE

Anton J. Haas, Jr., 6602 Spencer, Omaha, Nebr. 68104

Filed Jul. 14, 1983, Ser. No. 513,420

Int. Cl.³ B26B *3/08*

U.S. Cl. 30—90.4 **5 Claims**

1. A cable sheath cutter knife, comprising,

a handle portion,

a blade portion secured to said handle portion and extending downwardly therefrom,

said blade portion having rearward and forward sides and an elongated end portion extended between said rearward and forward sides,

said blade portion having a forwardly directed pointed tip portion on said end portion at the forward end thereof,

said blade portion having a first notch formed therein extending rearwardly into the forward side thereof adjacent said pointed tip portion such that said pointed tip portion partially defines said first notch,

said blade portion having a second notch formed therein extending forwardly into the rearward side thereof defining a leading end portion at the rearward end of said end portion, and

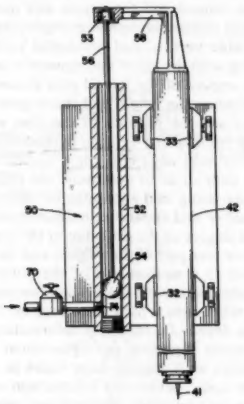
said end portion being tapered to a sharpened edge whereby, upon penetration of a cable sheath by said pointed tip portion and upon downward and forward rotation of said handle about said tip portion, said sharpened end portion is operative to cut through the sheath to position the sheath in the second notch for slicing the sheath in response to rearward movement of the knife along the cable.

4,507,868

COORDINATE MEASURING MACHINE WITH A SELF ALIGNING PNEUMATIC COUNTERBALANCE

John J. Tuss, Englewood, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Aug. 30, 1982, Ser. No. 413,099
Int. Cl.³ G01B *5/20*
U.S. Cl. 33—1 M **6 Claims**



1. In a coordinate measuring machine (**10**), including a base (**20**), a carriage (**30**) for movement relative thereto and a probe (**41**) disposed at the free end of a vertically extending probe arm (**42**) supported for vertical movement on said carriage for engaging features on an article to be measured, characterized by:

a precision adjustable air pressure regulator (**70**) having an inlet adapted to be connected to a pressurized pneumatic supply and an outlet;

a cylinder (**52**) mounted in said carriage alongside said probe and extending parallel thereto, said cylinder having an internal bore, with one closed end of said bore connected to the outlet of said precision adjustable air pressure regulator (**70**) and the other end of said bore vented to atmosphere;

a spherical piston (**54**) disposed within the bore of said cylinder (**52**) for relative movement therein and sized to have a clearance therebetween to permit pressurized air to leak around said piston;

an elongated piston rod (**56**) connected to said spherical piston (**54**) and extending within said cylinder;

a rigid bracket (**58**) secured to said probe arm (**42**); and,

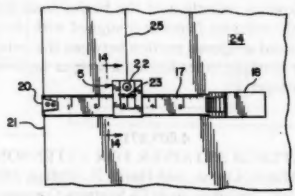
a spherical bearing (**53**) connecting said rod (**56**) to said rigid bracket (**58**), whereby as said probe arm moves vertically, counterbalanced with pressurized air in said cylinder, misalignments between said cylinder and said probe shaft are accommodated by said spherical piston and bearing to eliminate forces otherwise acting on said probe arm as a result of said misalignments.

4,507,869

MARKER ATTACHMENT FOR RULES

Michael E. Stude, 1020 S. Grove La., Barrington, Ill.

Filed Apr. 14, 1983, Ser. No. 484,974
Int. Cl.³ B43L *13/02*
U.S. Cl. 33—42 **8 Claims**



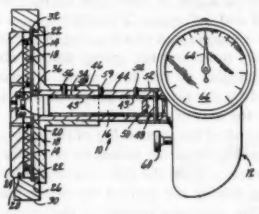
1. A marker attachment for an elongated rule or tape comprising a piece of flexible plastic sheet material formed into at least two panels integrally hinged along a hinge line and foldable over opposite sides of an elongated rule, said panels having integral tab-like projections on their distal ends with registering pencil-point receiving holes therein, and hook means integrally formed on the distal end of one of said panels for retaining said panels in their folded condition with said holes in registration, at least one of said panels having a window therein for viewing markings on said rule or tape.

4,507,870

INDICATOR GAGE ASSEMBLY FOR MEASURING INTERNAL ENLARGEMENTS

Franklin Meyer, Jr., P.O. Box 1, Forestdale, R.I. 02824

Filed Mar. 4, 1983, Ser. No. 472,068
Int. Cl.³ G01B *3/26, 5/12*
U.S. Cl. 33—147 K **11 Claims**



1. A gage assembly for measuring the diameter of an internal enlargement of a bore in a workpiece comprising an amplifying and indicating mechanism including a display upon which deviations from basic size are indicated, and also comprising a gage head insertable into the bore and including a pilot adapted to fit the bore closely adjacent the enlargement, a pair of radially slidable blades and means including an axially slidable plunger coupling the blades to the mechanism for indication of deviations on the display and the plunger being formed with a working taper for translating the radial movement of the blades into an axial movement of the plunger, a reduced diameter in engagement with the inner ends of the blades when the blades are retracted within the pilot for insertion of the pilot into and withdrawal from the bore while the inner ends of the blades remain in contact with the plunger and means for urging

the blades outwardly to enter the enlargement after the pilot has been inserted into the bore including a tapered portion on the plunger between the reduced diameter and the working taper having a steeper taper angle than that of the working taper.

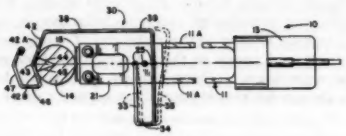
7. A gage head adapted to be coupled to an amplifying and indicating device for measuring the diameter of an enlargement in a bore in a workpiece, comprising a body including a cylindrical pilot portion adapted to fit closely into the bore and an elongated hollow shank, a pair of blades mounted in the body for opposite radial sliding motion, a plunger axially slidable in the shank and having one end adapted for releasable coupling to the device and its opposite end portion engaging the inner ends of the blades including a working taper engaging the blades and urging them into the enlargement, a reduced diameter allowing retraction of the blades from the enlargement when the reduced diameter is aligned with the inner ends of the blades and a tapered portion between the reduced diameter and the working taper having a steeper taper angle than the working taper.

4,507,871

QUICK ATTACH RETAINER FOR EXTENSOMETER

Richard A. Meyer, Carver, and Harry R. Meline, Minnetonka, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed May 5, 1983, Ser. No. 491,865
Int. Cl.³ G01N *3/04*
U.S. Cl. 33—148 D **17 Claims**



1. A spring clip for coupling an extensometer arm to a specimen to be tested with the extensometer arm extending generally laterally from the specimen and engaging a surface of the specimen on one side;

said clip comprising:

a continuous bent spring wire having a formed spring section comprising a pair of spaced spring legs joined at first ends thereof and defining a first plane;

means at a second end of a first leg of the spring section for pivotally mounting the spring section about a pivot axis perpendicular to the first plane, a second plane being defined by the pivot axis perpendicular to the first plane and to the axis of said first leg;

a second end of the second leg of the spring section extending laterally from the means to pivotally mount in opposite direction from the first end beyond the second plane;

a link leg joining the second leg of the spring section and extending generally parallel to the second plane in direction toward the means for pivotally mounting and said second leg extending in such direction substantially beyond the means for pivotally mounting; and

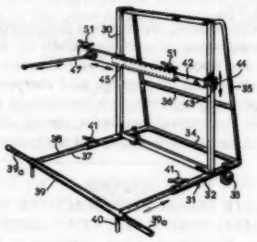
a spring force reaction member joined to the opposite end of the link leg from the second leg and extending laterally of the link leg through the second plane to define a space between the means for pivotally mounting and the spring force reaction member, to engage a specimen positioned between the spring force reaction member and the means for pivotally mounted and being of size to exert a force when the spring force reaction member is engaged with such specimen and the means for pivotally mounting is mounted on an extensometer so that the spring section resiliently resists separation of the means for pivotally mounting and the spring force reaction member.

4,507,872

METHOD FOR MEASURING THE STATE OF DAMAGE OF AN AUTOMOBILE VEHICLE AND MEASURING APPARATUS FOR CARRYING OUT SAID METHOD

Maurice Schermann, Tigeaux, France, assignor to Garages Mutualistes Francais, France

PCT No. PCT/FR82/00011, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02943, PCT Pub. Date Sep. 2, 1982
PCT Filed Jan. 20, 1982, Ser. No. 432,932
Claims priority, application France, Feb. 23, 1981, 81 03515
Int. Cl.³ G01B *5/255*
U.S. Cl. 33—174 R **13 Claims**



1. A method for measuring the damaged state of an automobile vehicle comprising employing means for ascertaining the deterioration of the vehicle as a function of the degree of the dent produced by impact and the nature and number of the damaged parts, said method comprising employing an apparatus having a variable vertical and horizontal position; determining and reading with the aid of said apparatus on a first side of the vehicle in respect of the lateral part thereof, measurements of data including the height and the degree of the dent due to the impact and the position of the dent relative to a median axis of the track of the vehicle; determining and reading with the aid of said apparatus on a second side of the vehicle the same data so as to determine the differences between the two data; using said apparatus for determining and reading with the aid of said apparatus, measurements including the height and the degree of the dent due to the impact undergone by the front or rear part of the vehicle and the position of the impact relative to a median axis of the vehicle so as to determine, by comparison with the original measurements of the same vehicle when new which were read off by means of said apparatus, the degee of a vector of deformation; assigning to said measurements repairing or replacement codes and combining said codes with damage zone codes so as to determine an "accident code" which, by comparison with similar accidents which were previously repaired and calculated and perform the function of standards and are recorded in a compilation of times, permits establishing the time required for reconditioning and permits listing the parts to be repaired or replaced, said "accident code" comprising a succession of zones in which are inscribed numbers having at least one figure advantageously identifying the make and the type of the vehicle and revealing the region of the impact, the identification of the parts to be repaired or replaced and the assessment of the situation and of the seriousness of the impact ascertained by said apparatus.

4,507,873

APPARATUS FOR ACCURATELY ESTABLISHING THE SEALING LENGTH OF CRT ENVELOPES

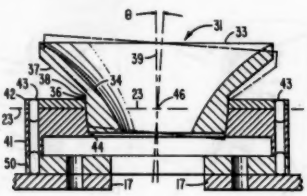
Randal L. Berardi, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,391
Int. Cl.³ H01J *9/18*
U.S. Cl. 33—180 R **4 Claims**

1. Apparatus for accurately establishing a preselected sealing

length between a sealing plane and reference plane within a contoured neck area of a funnel-shaped envelope comprising:

a support member having an internal contour configured to conform with and extending coextensive with said contoured neck area whereby said internal contour engages a major portion of said contoured neck area, said support member having an external convex bearing surface in the proximity of said neck area;



base means defining said reference plane spaced said preselected sealing length from said sealing plane, said base means including a concave bearing surface in the proximity of said reference plane, said concave and convex bearing surfaces being configured whereby said bearing surfaces contiguously engage to pivotably retain said support member said preselected sealing length from said sealing plane.

4,507,874

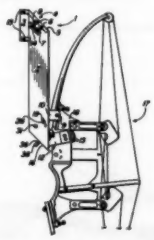
BOW SIGHT

Dewey E. Brown, Rte. 4, Box 126, Bastrop, La. 71220

Filed Jul. 11, 1983, Ser. No. 512,355

Int. Cl.³ F41G *1/46*

U.S. Cl. 33—265 **20 Claims**



1. A bow sight comprising a housing; a first opening in one end of said housing and a top mirror adjustably positioned in said one end of said housing and facing said first opening; a second opening in the opposite end of said housing and facing opposite said first opening and a bottom mirror in said opposite end of said housing facing said second opening and disposed in generally parallel relationship with respect to said top mirror; and a third opening in said housing between said first opening and said second opening and facing opposite said second opening and a compensating mirror adjustably positioned in said housing and facing said third opening, whereby a target image received by said top mirror and reflected to said bottom mirror is reflected by said bottom mirror to a viewer and the target image is simultaneously reflected by said compensating mirror to said bottom mirror and to the viewer for comparison and correction of an arrow trajectory.

4,507,875

APPARATUS FOR DETERMINING THE CONCENTRATION OF VAPORS IN A FLOWING GAS STREAM

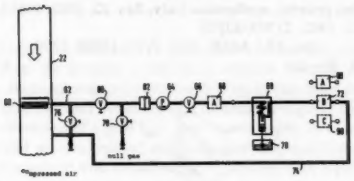
Werner Hirsch, Celle, and Uwe Ehling, Elmshorn, both of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 509,870

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1982, 3224506

Int. Cl.³ F26B *21/06*

U.S. Cl. 34—44 **12 Claims**



1. A device for determining the concentration of condensable vapor in a flowing gas stream comprising

(a) a gas evacuation conduit for receiving a sample of gas from the stream;

(b) a gas condenser in the evacuation conduit for condensing out essentially all of the condensable vapors in the sample;

(c) a gas flowmeter connected to the gas discharge of the gas condenser for determining the flow of the dry gas sample exiting the condenser;

(d) means for withdrawing a sample of gas from the flowing gas stream and for conveying this sample at a constant, known volumetric flow through the gas evacuation conduit and to the gas condenser and the flowmeter; and

(e) control means operatively connected to the flowmeter that determines the condensable vapor concentration by comparing the flow of the dry gas sample through the flowmeter with the known volumetric flow fed to the condenser.

4,507,876

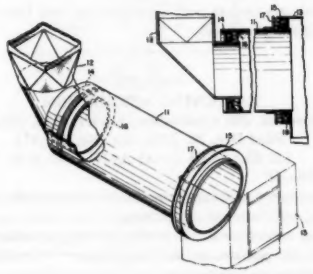
END SEAL FOR ROTARY TREATING DRUM

Lucas J. Conrad, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed May 23, 1983, Ser. No. 497,009

Int. Cl.³ F26B *25/08*

U.S. Cl. 34—242 **2 Claims**



1. An end seal for a cylindrical rotary treating drum comprising a flange attached to said drum at an end thereof in a plane perpendicular to the axis of rotation of said drum; a washer mounted on a housing adjacent said flange concentric with said axis; means for introducing gas between said washer

and said flange; and urging means adapted to urge said washer toward said flange, said urging means comprising resilient sponge material enclosed on three sides within a mounting ring of U-shaped cross-section with the fourth side of said material in urging relationship to said washer.

4,507,877

HEATER DEVICE, PARTICULARLY FOR SKI BOOTS

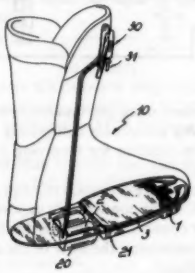
Franco Vaccari, Montebelluna, and Renzo Balbinot, Vittorio Veneto, both of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Filed Jan. 17, 1983, Ser. No. 458,676

Claims priority, application Italy, Jan. 22, 1982, 20611/82[U]; Apr. 28, 1982, 21707/82[U]

Int. Cl.³ A43B *7/02, 7/04;* **H05B** *1/00*

U.S. Cl. 36—2.6 **6 Claims**



1. A heater device for ski boots comprising:

an electric resistance heater located on an inner shoe of a ski boot and positioned at a user's foot;

at least one storage battery accomodated in a seat defined in said inner shoe;

said storage battery is electrically connected with said electric resistance heater;

an electric storage battery recharging socket located at the top portion of said inner shoe;

said electric storage battery recharging socket is connected to said storage battery;

an electric switch provided between said storage battery and said electric resistance heater;

a foil to radiate the heat toward the interior of said inner shoe and to provide thermal insulation to prevent heat loss from therein;

a lower portion of said electric resistance heater arranged to contact with said foil;

an insole associated with an uppers of said inner shoe and supporting said foil.

4,507,878

FASTENING MECHANISM

Hertzl Semouha, 280 Lindenshire, Exeter, N.H. 03833

Filed Dec. 20, 1982, Ser. No. 451,472

Int. Cl.³ A43B *11/00;* **A43C** *1/00, 3/00*

U.S. Cl. 36—50 **18 Claims**

1. A fastener for joining together two separable portions of an article, said fastener comprising

a pair of tracks, each said track for being attached to a said separable portion and for being spaced from the track on the other said portion,

lace securing means connected to said tracks comprising

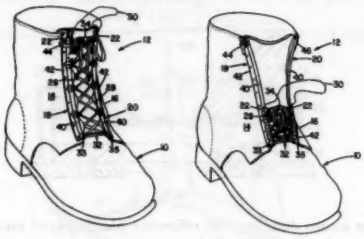
pairs of sliders, each slider of a pair being slidably mounted on a said track, and

flexible tension-bearing substantially-inelastic cord-type bridge connectors attached between adjacent said sliders on the same said track such that they space said sliders along said track when the end sliders of said track are pulled away from each other,

said bridge connectors being substantially inelastic along the directions of sliding along said tracks,

said bridge connectors being free to move away from said tracks when said sliders are moving together,

said bridge connectors being adapted to move without friction as said sliders move along said tracks, and



adjustable lace means connected between said lace securing means on said sliders such that movement of said sliders together along said tracks permits said two separable portions to separate, and movement of said sliders away from adjacent sliders along said tracks causes said separable pieces to move together,

said lacing means being adjustable to vary the distance between said separable portions when said sliders are spaced apart.

4,507,879

ATHLETIC SHOE SOLE, PARTICULARLY A SOCCER SHOE, WITH A SPRINGY-ELASTIC SOLE

Armin Dassler, Herzogenaurach, Fed. Rep. of Germany, assignor to PUMA-Sportschuhfabriken Rudolk Dassler KG, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,289

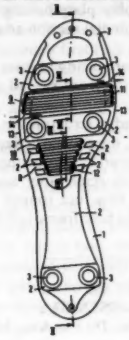
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1982, 3206305

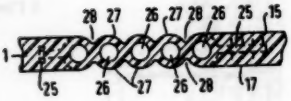
Int. Cl.³ A43B *13/18, 5/00*

U.S. Cl. 36—102 **25 Claims**

1. Athletic shoe sole with an insole and springy-elastic outer sole made of a plastic material, such as a polyamide, to which traction fittings in the form of at least one of studs, claws and spikes are attached and which is provided, in a ball area of the outer sole, with a flexible zone comprised of parallel ribs extending transversly across the outer sole, wherein said ribs are formed, on a ground contacting side of the outer sole, as well

as on a side thereof directed toward the insole, as a continuous undulating band of wave crests and valleys which rise and fall





relative to both said ground contacting side and the insole directed side thereof.

4,507,880

BOOT CONTAINING VENTILATION MEANS

Kazuo Ohashi, Tokyo, Japan, assignor to Kabushiki Kaisha Patine Shokai, Tokyo, Japan

Filed Jan. 18, 1983, Ser. No. 458,961

Claims priority, application Japan, Sep. 9, 1982, 57-135963[U]; Oct. 26, 1982, 57-186725

Int. Cl.³ A43B *5/16*

U.S. Cl. 36—115 **8 Claims**

1. A boot comprising:

an air permeable boot-shaped substrate having a sole portion and being made of a soft pliable material;

an outer sheath made of a synthetic material integrally formed with said substrate and covering the outside thereof, said outer sheath having a sole part in registration with said sole portion of said substrate;

separate air permeable means provided in at least a portion of the sole part of the outer sheath and comprising a plurality of ventilation holes for ventilation between the inside and outside of said outer sheath; and

at least one waterproof air-permeable layer made of a synthetic material provided between said substrate and the outer sheath in at least the portion of the sole part of the outer sheath containing said air permeable means.

4,507,881

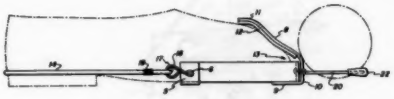
DEVICE FOR RETRIEVAL OF GOLF BALLS

Guiseppe Fossa, 1019 Russell Dr., Highland Beach, Fla. 33431

Filed Jul. 18, 1983, Ser. No. 514,934

Int. Cl.³ A43C *11/00*

U.S. Cl. 36—132 **5 Claims**



1. A device for retrieval of golf balls or similarly shaped objects from the ground comprising resilient flexible means having a shape substantially corresponding to the outer perimeter of a golf ball and normally of a dimension slightly smaller than the diameter of a golf ball, said means being formed of a material and so constructed and arranged that application of manual pressure to said means when in contact with a golf ball effects flexure therewith and results in frictional gripping of the golf ball thereby permitting removal of a golf ball from the ground and means supporting said flexible means wherein said means supporting said flexible means is so structured to engage the sole of a golf shoe or similarly shaped shoe and means for releasably retaining said means supporting said flexible means on the shoe, wherein said supporting means comprises an inverted U-shaped flexible strap having free ends and so shaped for engaging the opposed sides of a shoe, means secured to the free ends and the intermediate portion of said strap for engagement with the sole of a shoe, said means secured to said intermediate portion of said strap further including means constructed and so shaped for engaging the top surface of a shoe, and stretchable means secured to the free ends of said strap for frictionally engaging the heel area of a shoe thereby permitting said support means to be removably secured to a shoe.

4,507,882

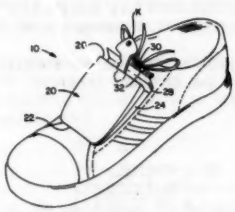
DETACHABLE SHOE-POCKET SYSTEM

Bruce W. Harrell, 3402 Auchentoroly Ter., Baltimore, Md. 21217

Filed Jun. 16, 1983, Ser. No. 504,888

Int. Cl.³ A41B *3/16*

U.S. Cl. 36—136 **7 Claims**



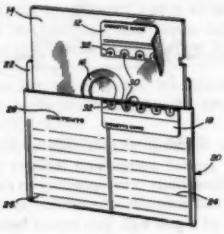
1. A shoe pocket system comprising: a body including a sheath with a closed bottom and sides and an open top, and means for mounting the sheath on the instep of a lace-type shoe, said means for mounting including a tongue having perforations at an upper end thereof; said tongue attached at said closed bottom and proportioned for extending freely to said perforate upper end; a perforate upward extension of said body above said open top, and said perforations of the tongue and perforate upward extension being in alignment for shoe lace passage therethrough and tying for securing the shoe pocket system on shoe instep.

4,507,883

THREE PART DISKETTE LABELING SYSTEM

Thomas G. Tarrant, P.O. Box 199, Hunt, Tex. 78024

Filed Jan. 18, 1983, Ser. No. 458,778
Int. Cl.³ A44C 3/00
U.S. Cl. 40—2 R **2 Claims**



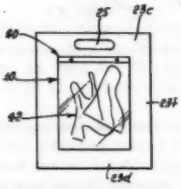
1. In combination with a flexible diskette having information magnetically recorded thereon in a plurality of tracks, a non-removable protective carrier enclosing the diskette but enabling the information thereon to be recorded and retrieved, a storage envelope for the protective carrier and diskette therein, that improvement comprising a three part labeling system including a two part label comprising a first label part mounted on the front panel of the storage envelope adjacent the upper edge thereof and a second label part mounted on the protective carrier adjacent to but above the upper edge of the front panel of the storage envelope and in alignment with and in registry with said first label part mounted on the envelope when the protective carrier is completely inserted into the envelope with a portion of the protective carrier projecting above the upper edge of the front panel of the envelope, each label part including indicia, the label part on the envelope having the indicia along the upper edge of the label part and the label part on the protective carrier having the indicia along the lower edge of the label part and adjacent to and in registry with the indicia on the label part on the envelope when the protective carrier is inserted into the envelope, said storage envelope having indicia thereon spaced from the second label part and relating to the information recorded on the diskette with the indicia on the envelope forming a third label part.

4,507,884

PICTURE DISPLAY ASSEMBLY

Harout Kazanjian, 11456 W. Washington Blvd., Los Angeles, Calif. 90066

Filed Feb. 6, 1984, Ser. No. 576,933
Int. Cl.³ G09F 13/00
U.S. Cl. 40—152.2 **9 Claims**



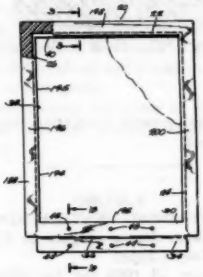
1. A picture display assembly, comprising
(a) a rectangular, upright base frame having front and back sides,
(b) means on the base from which it is connectible to a wall,
(c) first horizontal ledge structure on the base frame and exposed at the front side thereof, the first ledge structure having at least one upwardly projecting, horizontally elongated tongue,
(d) an upright picture display plate having front and back sides, and a transparent medial section adapted to register with said base frame,
(e) means on the plate for supporting at least one translucent picture sheet to hang at the front side of said medial section of the plate,
(f) and second horizontal ledge structure on and exposed at the rear side of the plate, the second ledge structure having at least one downwardly projecting, horizontally elongated tongue sized to removably and downwardly seat over the first ledge structure tongue for removably supporting the plate on the base frame and at the front side thereof.

4,507,885

ALBUM ASSEMBLY

Wolcott S. Kinnard, 5822 W. Fon Du Lac Ave., Milwaukee, Wis. 53218

Filed Apr. 5, 1982, Ser. No. 365,935
Int. Cl.³ G09F 11/06
U.S. Cl. 40—405 **8 Claims**



1. A one piece molded album page for displaying a flat object, comprising:
A. a rectangular frame comprising four edge members;
B. a track in the inside edge of three of the edge members, said track defining a space into which a leading, and side edges of a flat object to be displayed are received and retained;
C. a slot in the remaining edge member, coplanar with and in communication with said track, said slot dividing said remaining edge member into first and second opposing lips, said slot defining a space into which a trailing edge of a flat object to be displayed is received and retained;
D. a flap, extending outwardly from and generally parallel to the said remaining edge member, said flap secured to said first opposing lip by a flexible integral hinge, and;
E. means for fastening said flap onto a second opposing lip of another album page, said flap including a first fastening means and said second opposing lip of another page including a second fastening means.

4,507,886

DISPLAY SIGN

Bert E. Streeter; Mary M. Streeter, both of 4057 Concord Ave., Eugene, Oreg. 97402, and Larry G. Robinson, 660 "E" St., Springfield, Oreg. 97477

Filed Mar. 6, 1984, Ser. No. 586,854
Int. Cl.³ G09F 3/04
U.S. Cl. 40—447 **5 Claims**

1. A sign for displaying numerical information including a changeable numeral character, comprising:
(a) a foundation member having a front side and a rear side and defining a background area of a background color on

said front side and a plurality of apertures extending therethrough from said rear side to said front side;

(b) a plurality of flaps, each attached to said foundation member on said front side thereof in a respective location, and each having a first face of said background color and second face of a second color different from said background color;

(c) means for attaching each of said flaps to said foundation member within said background area, said means for attaching including at least one retainer portion associated with each said flap and a respective spring clip extending through one of said apertures defined in said foundation member and around each retainer portion of said flap, resiliently urging said retainer portion of said flap toward a position in which said retainer portion is adjacent said front side parallel with said background area;

(d) each said spring clip including a central section, a pair of rearwardly-extending legs connected with said central

section and extending approximately perpendicularly rearwardly therefrom, each having an outer end remote from said central section and an outwardly extending leg attached thereto and extending divergently forward alongside said rearwardly-extending leg, each said spring clip having said central section located on said front side of said foundation member and said outwardly extending legs located on said rear side thereof and resiliently pressing against said rear side;

(e) a plurality of areas of said second color, each corresponding to a respective one of said flaps and located on said foundation member where a respective one of said flaps covers said area when said first face of said respective one of said flaps is exposed and exposes said area when said second face of said flap is exposed; and

(f) a pair of corner areas of said second color located on said front side within said background area, defining upper and lower right corners of said changeable numeral character.

4,507,887

SIGN AND ATTACHMENT APPARATUS

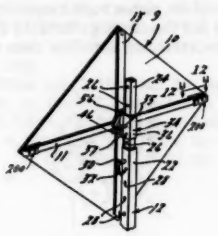
James R. Seely, Rochester, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Continuation of Ser. No. 498,804, May 27, 1983, abandoned. This application Jun. 22, 1984, Ser. No. 623,622

Int. Cl.³ G09F *15/00*

U.S. Cl. 40—606 **27 Claims**

1. In a sign assembly including a generally planar sign panel and at least one support member for supporting said panel in said generally planar configuration, the improvement comprising mounting means for releasably mounting said sign panel on said support member, said mounting means including at least one strap member secured to said sign panel and being positionable over at least a portion of said support member and releasable fastener means for releasably attaching said strap member to said support member, said releasable fastener having means being a pair of mutually engagable portions disposed between said strap member and said support member when said strap member is attached to said support member, said fastener being subjected primarily to shear loading when said sign panel is subjected to wind forces exerted generally in a



direction such that said wind forces tend to separate said sign panel from said support member.

4,507,888

MAGNETIC DIGITAL DISPLAY SIGN

Larry G. Robinson, Springfield, and Edward C. King, Eugene, both of Oreg., assignors to King Design, Inc., Eugene, Oreg.

Filed May 12, 1983, Ser. No. 493,970

Int. Cl.³ G09F *7/04*

U.S. Cl. 40—621 **15 Claims**

1. A sign for displaying information including numerals, comprising:

a background member of a first color;

a plurality of character elements having an appearance contrasting with that of the background member;

the background material and the character elements including magnetic means for attaching removably each character element to said background member in a location relative to at least one other of said plurality of character elements so as to form selectively any desired digit;

a permanently applied label on said background member; and

at least one alternative label including magnetic retention means for removably attaching said alternative label to said background member so as to obscure said permanently applied label.

4,507,889

SPEED LOADER

Dillis V. Allen, 240 Lincolnshire Ct., Schaumburg, Ill. 60193

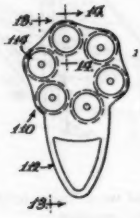
Continuation-in-part of Ser. No. 262,224, May 11, 1981, abandoned. This application Jan. 7, 1983, Ser. No. 456,360

Int. Cl.³ F42B *39/04*

U.S. Cl. 42—89 **17 Claims**

1. A speed loader for loading cartridges into a revolver having annularly arrayed chambers in a cylinder, comprising; a generally planar one-piece flexible body member, having an outer and an inner surface spaced therefrom, constructed of a flexible elastomeric material, said member having a central generally circular portion with a plurality of annularly arrayed apertures therein extending substantially completely therethrough, each adapted to receive one cartridge, each of said apertures having a cylindrical guide portion engagable with

the cartridge of sufficient length to hold the cartridge substantially perpendicular to the planar body member, each of said apertures having a rim engaging portion discontinuous with the outer surface of the planar body member to facilitate the release of the rim and the cartridge from the aperture, and an integral projection extending from the central portion, said



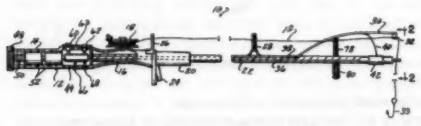
planar body member having sufficient resiliency so that the cartridges loaded in the body member may be simultaneously loaded in the revolver chambers with the shooter's thumb placed on the outer surface of the body member and one of his fingers placed under the projection raising the body member over the rims of all the cartridges substantially simultaneously to release the cartridges in the revolver chambers.

4,507,890

FISHING ROD INDICATOR

Keith Thorne, 7110 North Milford Rd., Holly, Mich. 48442

Filed Nov. 21, 1983, Ser. No. 553,377
Int. Cl.³ A01K *97/12*
U.S. Cl. 43—17 **1 Claim**



1. A fishing rod indicator comprising:

a handle;

a rod portion having one end carried by said handle, said rod portion having a fixed line guide at its other end;

said rod portion further having a movable member affixed at said other end, said movable member being positioned vertically above said other end of said rod portion and carrying a movable line guide spaced from said fixed line guide;

a reel having a line carried thereby, said reel being mounted on said handle, said line passing from said reel and respectively through said movable and fixed line guides, said movable member and movable line guide being brought from a first, spaced position to a second position which is nearer to said fixed guide when a tension is exerted on said line;

a first electrical contact means carried by said movable member and movable therewith;

a second electrical contact carried by said rod and being engaged by said first movable contact when said movable member is moved toward said fixed guide;

said first electrical contact means being formed of a flexible material such that its configuration can be altered so as to adjustably vary the spacing between said first and second contact means when said movable member is in said first position, whereby the distance traveled by said movable member before contact is made between said electrical contacts can be selectively varied;

a pair of electrical conductors extending through said rod portion and said movable portion and terminating in said first and second electrical contact means;

signal means carried by said handle and connected to said electrical conductors, said signal means adapted to be energized in response to said contact between said first and second electrical contact means; and

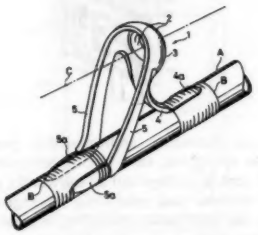
means disposed between said movable member and said handle for selectively varying said first spaced position whereby the amount of tension required to cause said movable contact to engage said fixed contact is variable.

4,507,891

LINE GUIDE

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Japan

Filed Mar. 10, 1983, Ser. No. 473,942
Claims priority, application Japan, Mar. 17, 1982, 57-41974
Int. Cl.³ A01K *87/04*
U.S. Cl. 43—24 **5 Claims**



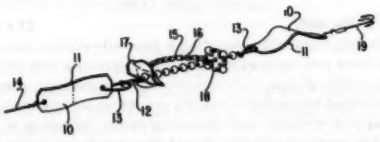
1. A fishing line guide comprising a line guide ring, a frame for supporting said ring, legs extending from the edge of said frame and adapted to be fixed over the surface of a fishing rod, said frame being formed into a substantial truncated cone that tapers to said guide ring thereby dispersing the force of any external impact on the guide away from the guide ring and into the legs.

4,507,892

SPINNER TYPE FISHING LURE

Joe A. Ochs, 405 South Summit Ave., Sioux Falls, S. Dak. 57104

Filed Aug. 22, 1983, Ser. No. 525,437
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.18 **5 Claims**



1. A fishing lure comprising a pair of plates, said plates being each formed with a curve in said plate, wire means attached to each plate adapted to hold said plates in substantially perpendicular relationship to each other, the axis of curvature of the curve in each plate being perpendicular to the axis of said wire means, and fish attracting means disposed on said wire means.

4,507,893

CABINET

Ronald W. Smith, 2300 Lazy Hollow #343-D, Houston, Tex. 77063

Division of Ser. No. 222,248, Jan. 2, 1981, Pat. No. 4,341,040, which is a division of Ser. No. 53,071, Jun. 28, 1979, Pat. No. 4,260,206. This application May 5, 1982, Ser. No. 375,000
The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.
Int. Cl.³ A01G 9/02
U.S. Cl. 47—74 2 Claims

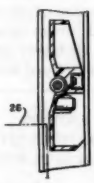
1. A plant container comprising: A unitary member of biodegradeable material having a bottom and side portion said bottom and side portion including uniformly spaced ridges with apertures intermediate said ridges, said side portion further including means for manually dividing adjacent portions of said side portion, whereby a plant contained therein may easily be removed.

4,507,894

WINDOW STRUCTURE

Richard N. Anderson, Owensboro, Ky., assignor to V. E. Anderson Mfg. Co., Owensboro, Ky.

Division of Ser. No. 50,818, Jun. 21, 1979, Pat. No. 4,398,372. This application Aug. 16, 1983, Ser. No. 523,831
Int. Cl.³ E05D 13/04
U.S. Cl. 49—449 6 Claims



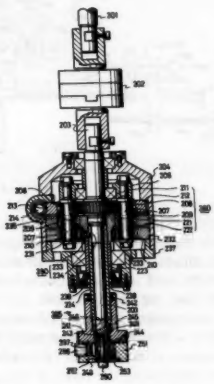
1. Window structure comprising a frame having jamb members and at least one sash within the frame movable within the plane of the frame and pivot lock structure movable between two limiting positions thereof for securing the sash in one position of the sash within the frame in one limiting position of the pivot lock structure and for permitting movement of the sash within the plane of the frame in another limiting position thereof which pivot lock structure includes a lever, pivot means mounting the lever centrally thereof to one jamb adjacent the sash in the one position of the sash, said lever having a back forming an obtuse angle of greater than 180° with the apex of the angle substantially at the pivot means, said lever being mounted on the jamb by the pivot means in relation to the sash so that one end of the lever extends into the path of movement of the sash in the plane of the frame with the back of the other end of the lever in flush, surface to surface engagement with the jamb with the lever in one limiting position thereof and with the lever pivoted in the opposite direction to place the lever in the opposite limiting position the back of the one end of the lever is in flush, surface to surface engagement with the jamb and the front surface of the lever is substantially parallel to the plane of the frame and the entire lever is out of the path of movement of the sash in the plane of the frame.

4,507,895

RADIALLY ADJUSTABLE INTERNAL GRINDER

Hideo Sakata, and Tokuzo Nakaoki, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co. Ltd., Tokyo, Japan

PCT No. PCT/JP82/00097, § 371 Date Nov. 15, 1982, § 102(e) Date Nov. 15, 1982, PCT Pub. No. WO82/03354, PCT Pub. Date Oct. 14, 1982
PCT Filed Apr. 2, 1982, Ser. No. 444,397
Claims priority, application Japan, Apr. 8, 1981, 56-52734; Apr. 10, 1981, 56-54659; Apr. 10, 1981, 56-54660; Nov. 4, 1981, 56-176925; Nov. 4, 1981, 56-176926; Nov. 16, 1981, 56-183500
Int. Cl.³ B24B 5/08, 33/00
U.S. Cl. 51—98 R 7 Claims



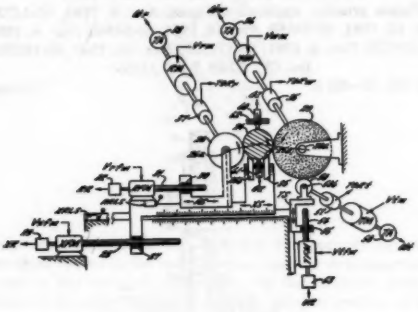
1. An internal grinder, comprising:
a grind stone head;
a plurality of grind stones arranged circumferentially on said grind stone head, the radial projection values of the grind stones being adjustable during rotation of said grind stone head, said grind stone head including a grind stone holding member having radial guides to guide the grind stones, said grind stone holding member being affixed to one end of a spindle;
a projection value adjusting member affixed to one end of a shank coupled onto said spindle, said projection value adjusting member having a projection value adjusting guide formed as an Archimedean spiral with its origin positioned on the axial line of said spindle, said projection value adjusting guide having slidably inserted therein adjusting pins affixed to said grind stones to thereby engage said projection value adjusting guide with said grind stones;
a differential mechanism including a motive power gear fixed to said spindle, a differential internal gear connected to a finger grip means carried on the outer peripheral portion of a case member, and at least two planet gears;
a linear movement causing mechanism having a linear movement causing gear rotatable alternatively in synchronism with and relative to said spindle;
said linear movement causing mechanism further having means responsive to rotation of said linear movement causing gear relative to said spindle for axially moving said shank with respect to said spindle even during rotation of the spindle, for allowing the adjustment of said radial projection values, said means for axially moving including slidably coupled members fixed on said shank and linear movement causing gear, said slidably coupled members being a spiral groove and a projection slidably coupled in said spiral groove;
a mount having work fixing means; and
a moving mechanism for moving said grind stone head relative to the mount in the axial direction of said spindle.

4,507,896

CENTERLESS GRINDING SYSTEMS

Roderick L. Smith, Rockford, Ill., assignor to Energy Adaptive Grinding, Inc., Rockford, Ill.

Filed Nov. 30, 1982, Ser. No. 445,689
Int. Cl.³ B24B 49/16
U.S. Cl. 51—165.92 20 Claims



1. A centerless grinding system comprising

a driven grinding wheel, a driven regulating wheel, and a work rest blade for centerless grinding of a workpiece supported by said work rest blade between said grinding wheel and said regulating wheel,

means for determining the rate of reduction of the workpiece radius while it is being ground, and

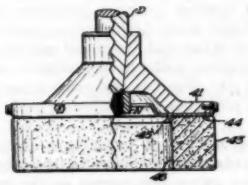
means responsive to said rate of reduction of the workpiece radius for controlling the ratio of the power consumed in removing workpiece material to the rate of removal of workpiece material by the grinding wheel.

4,507,897

GRINDING HEAD ASSEMBLY

Robert G. Vieau, Plymouth, and William D. Klempke, Brooklyn Park, both of Minn., assignors to Loram Maintenance of Way, Inc., Hamel, Minn.

Filed Dec. 20, 1982, Ser. No. 450,913
Int. Cl.³ B24B 45/00; B24D 7/02
U.S. Cl. 51—209 R 4 Claims



1. A grinding head assembly comprising:

a. a backing plate holder adapted to be drivingly connected for rotation with a drive shaft, said backing plate holder having a downwardly facing annular plane surface substantially perpendicular to the axis of rotation of said drive shaft and an outermost peripheral edge symmetrically oriented about said axis;

b. an annular backing plate having an upwardly facing annular plane surface and an outer flange extending upwardly from said backing plate annular plane surface, said outer flange having an exposed outer sidewall and an internal sidewall defining an upwardly facing backing plate holder receiving cavity; said outer flange having a plurality of upwardly facing notches disposed thereon

c. an annular grinding wheel permanently mounted to an underside of said plane surface of said backing plate and having an inner wall; and

d. means for fastening said outer flange of said backing plate to said peripheral edge of said backing plate holder including threaded securing means abuttable against said backing plate flange exposed outer sidewall extending through said upwardly facing notches and securable to said peripheral edge of said backng plate holder for urging said backing plate flange internal sidewall into tight frictional engagement with said backing plate holder outer peripheral edge,

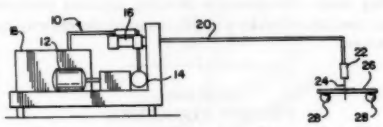
e. said backing plate holder being received within said backing plate holder receiving cavity in a tight fit whereby said backing plate is inherently centered by said holder relative to said axis of rotation.

4,507,898

ABRASIVE LIQUID JET CUTTING APPARATUS

Peter H. Hofer, Barrington, Ill., assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 253,440, Apr. 13, 1981, Pat. No. 4,380,138.
This application Sep. 28, 1982, Ser. No. 424,939
Int. Cl.³ B24C 3/00
U.S. Cl. 51—410 13 Claims



1. Apparatus for generating abrasive liquid cutting jet comprising:

a nozzle;

means for generating a high velocity, relatively thin liquid jet from said nozzle; and

an abrasive particle carrier comprising a thin solid layer of material having a plurality of abrasive particles bonded to a surface thereof, said carrier being disposed for penetration by said liquid jet such that said abrasive particles are at least momentarily entrained with said liquid jet.

4,507,899

UNDERGROUND SHELTER

Manfred Janitzky, Konigstrasse 10, 4053 Juchen 5, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 422,559
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144141
Int. Cl.³ E02D 27/00
U.S. Cl. 52—169.6 12 Claims

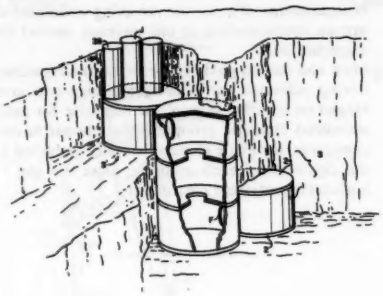
1. An underground protective shelter, comprising:

a plurality of connected protective cells hermetically sealed with one another and held together by clamping elements, each protective cell having an inner protective chamber and at least one opening for entrance to said inner chamber, the cells being formed from prefinished building components of steel-reinforced concrete and including a substantially circular disk forming at least one of an upper covering, an intermediate ceiling, and a lower closure, and a cylinder ring disposed against said disk;

one of the cells being an entrance cell and comprising an inner passageway connected to an outer entrance passageway, the inner passageway having an access to the inner protective chamber of the entrance cell and the outer entrance passageway having an access above the entrance cell in an above ground area, the connection of the passageways and the accesses being formed by hermetically sealable doors, the outer entrance passageway having a

further door which opens to a below ground entrance tunnel;

a two stage air filter, a first stage of said filter being located outside the cells, and a second stage being located in the inner passageway and having a replaceable filter element; and,



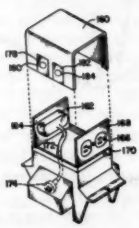
means for maintaining the protective shelter at an air pressure in excess of atmospheric pressure, including a pressure-openable exhaust valve vented to the outside, whereby exhaust air coming from the inner chambers of the cells and flowing through the inner passageway and the outer entrance passageway is continuously pushed to the outside.

4,507,900

ELECTRICAL DISTRIBUTION FOR METAL DECK CONSTRUCTION

Donald H. Landis, Pittsburgh, Pa., assignor to Epic Metals Corporation, Rankin, Pa.

Filed Feb. 22, 1983, Ser. No. 468,492
Int. Cl.³ E04B *5/48*
U.S. Cl. 52—221 **25 Claims**



1. A metal raceway structure adapted for use in concrete-metal composite construction comprising

an elongated metal deck having alternating ribs and valleys,

means underlying and cooperating with said metal deck to define a plurality of cells,

said metal deck having first and second spaced ribs of generally equal height,

a third rib interposed between the first and second ribs,

said ribs having a top wall and depending side walls,

said first and second ribs having side wall openings in side walls generally facing said third rib,

housing means having at least a portion disposed in overlying relationship with respect to said third rib,

said housing means having an interior chamber and a mouth disposed at the upper end of said housing,

a first housing electrical receptacle disposed within said housing having socket means facing the interior of said housing means,

said third rib having at least one top wall opening,

at least one remote electrical receptacle disposed in generally overlying relationship with respect to said housing chamber,

electrical wire means electrically connecting said first housing receptacle to said remote receptacle,

said electrical wire means having a plug removably extending into said first housing receptacle, and

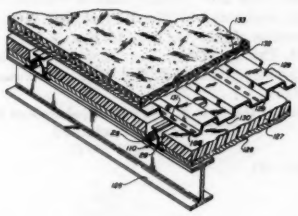
said electrical wire means being of sufficient length to permit said remote electrical receptacle to extend upwardly beyond said housing mouth when said plug is engaged with said first housing receptacle, whereby said remote receptacle may have its sockets facing in a generally horizontal direction or in a generally vertical direction without loss of electrical continuity.

4,507,901

SHEET METAL STRUCTURAL SHAPE AND USE IN BUILDING STRUCTURES

Frank E. Carroll, 237 Maple Rd., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 762,778, Jan. 25, 1977, Pat. No. 4,114,335, which is a continuation-in-part of Ser. No. 648,500, Jan. 12, 1976, Pat. No. 4,048,777, which is a continuation-in-part of Ser. No. 457,996, Apr. 4, 1974, Pat. No. 3,965,641. This application Sep. 19, 1978, Ser. No. 943,866
The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.
Int. Cl.³ E04B *5/10*
U.S. Cl. 52—302 **9 Claims**



1. In an insulated deck structure the components comprising:

a spaced series of parallel sheet metal structural shapes which are symmetrical about a bisecting plane through a central web having a central web, two diagonal legs projecting downwardly from one end of said web forming an included angle of about 30° to about 90° between said legs and having its vertex at the bottom of the web, said diagonal legs having a vertical height of about 1¼ to about 10 inches, each diagonal leg having a leg projecting downward at its extremity in a plane substantially parallel to said web, said legs being substantially parallel, each of said parallel legs having flanges extending outwardly at their extremity, a closure side extending between the extremities of said flanges enclosing the area formed by said diagonal sides, said parallel sides and said closure side, and a stiffening member at the other end of said web, said stiffening member being narrower than said flanges and substantially less height than the height of said diagonal legs;

insulation resting on said flanges and extending between adjacent structural shapes; and

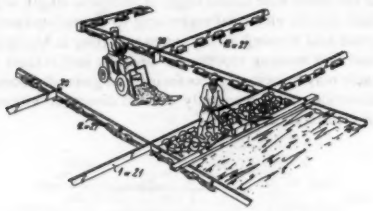
corrugated synthetic polymeric decking above and fastened to the stiffening member of said structural shape.

4,507,902

DEVICE FOR THE FORMATION OF A JOINT FOR AN INDUSTRIAL TYPE FLOORING

Jean-Claude Lucas, 6, Allée Gaston Buy, F-35400 Saint-Malo, France

Filed Jun. 10, 1982, Ser. No. 386,894
Int. Cl.³ E04B 2/00
U.S. Cl. 52—370 10 Claims



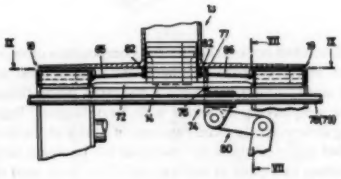
1. A joint for use in a concrete deposit, said joint being made of a plurality of spaced vertical supports, each of said supports being an integral structure having two oblique anchoring legs and an upwardly extending lug portion with hollowed sections on opposite sides of the lugs, an elongated unitary joint body having a downwardly oriented U-shaped cross section forming two spaced vertical flange legs for straddling and completely covering said lug portions of said spaced vertical supports, the tips of the U-shaped cross sections fitting into the hollowed sections, each of the outside faces of said vertical flange having outwardly projecting spurs for hooking into the concrete.

4,507,903

PACKING CIGARETTES

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Pfuhl, Fed. Rep. of Germany

Continuation of Ser. No. 585,413, Jun. 9, 1975, Pat. No. 4,079,575. This application Dec. 22, 1977, Ser. No. 863,559
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1974, 2428168
The portion of the term of this patent subsequent to Mar. 21, 1995, has been disclaimed.
Int. Cl.³ B65B 19/10
U.S. Cl. 53—151 6 Claims



1. Apparatus for packaging cigarettes which are ejected in groups from a magazine, comprising:

(a) a magazine having a plurality of magazines chutes in lower portions thereof, each chute receiving a vertical row of cigarettes;

(b) reinforcement support rods at the lower end of walls of said chutes which abut the respective bottom cigarettes within each magazine chute;

(c) slit-like openings formed between the support rods the width of which is smaller than the diameter of one cigarette;

(d) a common, reciprocating slide having a number of fingers corresponding to the number of magazine chutes to be emptied which enter the magazine chutes and engages a plurality of layers of cigarettes stacked one above the other so as to eject cigarette groups corresponding to one package from the magazine alternatively to either one or the other side;

(e) each finger having a portion which passes through the slit-like openings;

(f) first and second conveyor means arranged one on opposite sides of said magazine, said conveyor means having compartments of a size for receiving assembled cigarette groups corresponding to one package ejected from said magazine; and

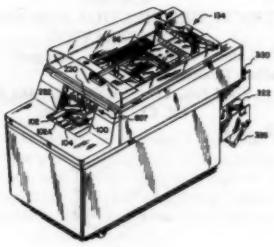
(g) first and second guide elements for the cigarette groups having sidewalls for holding the cigarette groups arranged on opposite sides of the magazine for guiding the assembled cigarette groups to the compartments of the conveyors, the guide element laterally gathering together the cigarettes of each group to close the gap between horizontally adjacent cigarettes.

4,507,904

FILM AND PACKAGE HANDLING APPARATUS FOR WRAPPING MACHINE

Fritz F. Treiber, Centerville, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Apr. 26, 1982, Ser. No. 371,686
Int. Cl.³ B65B 7/28
U.S. Cl. 53—203 10 Claims



1. In a film wrapping machine wherein packages are wrapped by folding a stretchable, heat sealable film to the underside of the packages, film feeding and package sealing-/conveying apparatus comprising:

film feeding means for providing a source of continuous stretchable film to be drawn into said wrapping machine for wrapping packages;

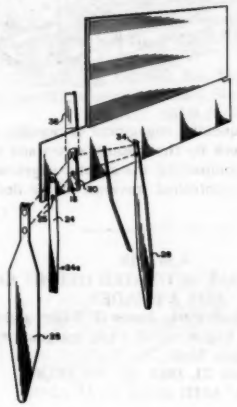
package sealing/conveying means for heat sealing the film folded on the underside of wrapped packages and for conveying wrapped packages from said machine, said package sealing/conveying means being positioned in close physical proximity above said film feeding means; and

package sealing holddown means positioned over said package sealing/conveying means for forcing wrapped packages into firm contact with said package sealing/conveying means, said package sealing holddown means and said package sealing/conveying means being hingedly mounted to said machine to permit upward pivotal movement in line with said machine and away from said film feeding means, and including latching means for interlocking said package sealing holddown means with said package sealing/conveying means in a raised position to facilitate access to said film feeding means.

4,507,905
GUIDE FINGER MOUNTING FOR CASE PACKER ASSEMBLY HEADS

Daniel L. Goodell, Tallmadge, Ohio, assignor to Figgie International Inc., Willoughby, Ohio

Filed Feb. 16, 1982, Ser. No. 349,264
Int. Cl.³ B65B *39/02*
U.S. Cl. 53—262 **7 Claims**



1. A guide finger mounting apparatus for case packers having article assembly heads including partition plate means extending the length of one dimension of the assembly head and wherein means feed streams of abutted articles onto the assembly head in rows between pairs of adjacent partition plate means, the mounting apparatus comprising:

a positioning member having at least one continuous flat outer surface extending longitudinally of the member,

a spring drop finger means positioned on said flat surface of said positioning member; and

a clip means slidably engaging said finger means and said positioning member to press said finger means into operative position on said positioning member and retain it in position against movement downwardly of said member,

said spring drop finger means including a plastic spring finger having an enlarged head that is positioned above and protrudes over the end of said clip means.

4,507,906
HINGED BAG TOP FOLDER

James A. Meyer, Deronda, Wis., assignor to Doboy Packaging Machinery, Inc., New Richmond, Wis.

Filed Sep. 27, 1982, Ser. No. 423,552
Int. Cl.³ B65B *7/16*
U.S. Cl. 53—371 **16 Claims**

1. In a bag sealing machine of the type having conveyer means mounted on a frame for transporting a bag to be sealed along a straight line path of travel from an infeed point to a discharge point with the top portion of the bag extending vertically upward from said conveyer means, a bag top folder disposed in said path to engage said top portion of the bag in its course of travel comprising:

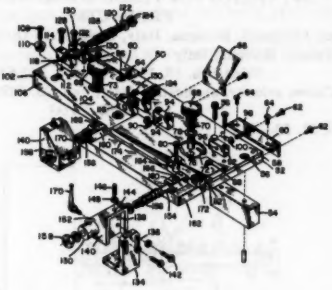
(a) a stationary base plate affixed to said frame with one vertical edge thereof disposed above said conveyer and generally aligned with a vertical plane containing the center line of said conveyer;

(b) movable top plate means disposed on said base plate;

(c) first folder means attached to said top plate means and having a working edge extending at a predetermined angle to and intersecting said vertical plane containing said center line, said working edge having a chamfer;

(d) second folder means mounted on said top plate with a portion thereof overlaying said path of travel and having a working edge sloping downwardly toward said discharge point; and

(e) movable front blade means having a working edge dis-

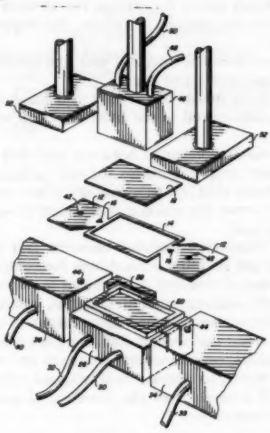


posed in a parallel, non-contacting relationship with respect to said vertical edge of said base plate to allow the top of said bag to pass between said vertical edge of said base plate and said working edge of said movable front blade means.

4,507,907
EXPENDABLE HEATER SEALING PROCESS

Sumner H. Wolfson, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Sep. 2, 1981, Ser. No. 298,786
Int. Cl.³ B65B *7/28, 51/10, 51/22*
U.S. Cl. 53—478 **7 Claims**



1. A method of hermetically sealing a package containing electronic components to a lid, said package and said lid having sealing surfaces, comprising the steps of:

coating the sealing surfaces of said package and said lid with a layer of glass;

placing a metallic heating element between the sealing surfaces of said package and said lid, said heating element being coated with a layer of glass and having an area and shape corresponding substantially to the sealing surfaces of said package and said lid to reduce the amount of heat needed to effect a seal; and

heating said heating element to melt the glass on said pack-

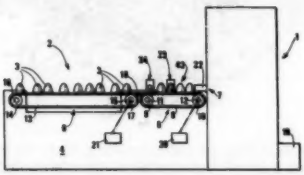
age and said lid and on said heating element to effect a seal between said package and said lid, said heating element becoming a permanent part of said seal.

4,507,908

APPARATUS FOR FEEDING AND WRAPPING PRODUCTS

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azione, Bologna, Italy

Filed Feb. 10, 1982, Ser. No. 347,635
Claims priority, application Italy, Feb. 25, 1981, 3345 A/81
Int. Cl.³ B65B *35/00*
U.S. Cl. 53—498 **5 Claims**



1. In an apparatus for feeding and wrapping products comprising a wrapping machine having means for operating said wrapping machine and a device for feeding products to said wrapping machine which device includes a first belt conveyor for receiving products from a dispensary apparatus, a second belt conveyor connecting said first conveyor to said wrapping machine, a stop element located on and at the end of said second conveyor adjacent said wrapping machine, and first and second control means selectively positioned along said second conveyor at increased spacing, respectively, from said wrapping machine, said first and second control means each having sensing means for sensing the absence or presence of products on said second conveyor, the improvement which comprises:

first drive means for driving said first conveyor at either a high speed or a low speed;

second drive means for driving said second conveyor at a continuous speed in the same direction as said first conveyor;

switch means connected between said first control means and said operating means for said wrapping machine to deactivate said operating means when said first control means senses the absence of products on said second conveyor; and

control circuitry connected between said second control means and said first drive means for controlling the driving speed of said first drive means in response to the output from said second control means, wherein said control circuitry causes said first drive means to operate at high speed when said second control means senses the absence of products on said second conveyor and causes said first drive means to operate at low speed when said second control means senses the presence of products on said second conveyor.

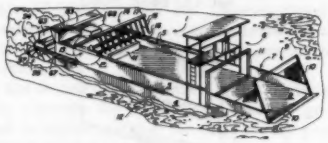
4,507,909

COMPACTOR AND PADDLE WHEEL FOR AQUATIC HARVESTER

Thomas G. Kelpin, Sr., Shreveport, La., assignor to Abraham C. Kottothara, Loudonville, Ohio

Filed Dec. 12, 1983, Ser. No. 560,380
Int. Cl.³ A01D *44/00*
U.S. Cl. 56—9 **20 Claims**

1. In an aquatic harvester having a deck, pontoons disposed beneath the deck, a loading apron provided on one end of the deck and an aquatic vegetation cutter in cooperation with the loading apron, wherein the improvement comprises a carriage characterized by a frame; wheels carried by said frame; rail means extending longitudinally along the deck in spaced relationship and receiving said wheels; and drive means carried by said frame, whereby said wheels are selectively caused to traverse said rail means in a forward and reverse direction along the deck; and rake means pivotally carried by said frame



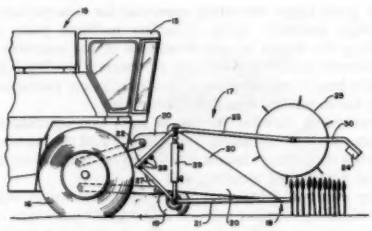
and adapted for sequential engagment of aquatic vegetation deposited on the deck by the loading apron and selectively redistributing and compacting the aquatic vegetation on the deck responsive to controlled traversal of the deck by said carriage.

4,507,910

AUTOMATIC SONAR ACTIVATED HEIGHT CONTROL FOR A HEADER

W. Ray Thornley, Hyde Park; James G. Wiser, and E. Cordell Lundahl, both of Logan, all of Utah, assignors to Ezra C. Lundahl, Inc., Logan, Utah

Filed Nov. 21, 1983, Ser. No. 553,840
Int. Cl.³ A01D *41/00, 41/12, 45/00*
U.S. Cl. 56—10.2 **11 Claims**



1. In a header height control system for a mobile farm implement having a body carrying a mounted header, an automatic control system for continuously controlling the operating height of the header, said control system comprising:

a sonar sensor means mounted on the header and positioned so as to be spaced just ahead of the front, leading end of the header, said sonar sensor means being adapted to generate and transmit ultrasonic waves toward the top of the crop in the vicinity immediately ahead of the header in the transport direction of the farm implement and to receive reflected, ultrasonic, echo waves reflected from said top of the crop back to said sonar sensor means, said sonar sensor means further being adapted to generate an electronic output corresponding to said reflected ultrasonic echo waves;

amplifying means for amplifying the electronic output of the sonar sensor means;

verifying means for verifying that said electronic output represents true, reflected, ultrasonic, echo waves from the top of the crop;

drive logic means adapted to analyze said electronic output which has been amplified and verified, and to generate a drive output corresponding to the distance between the sonar sensor means and the top of said crop as determined from the analysis of the amplified and verified electronic output of the sonar sensor means;

and

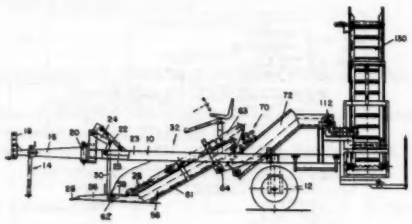
power lift means for raising and lowering the header; and means for activiating the power lift means of said header to continuously and automatically control the positioning of said header in accordance with the drive output of said drive logic means.

4,507,911

APPARATUS FOR HARVESTING AND SEPARATION OF PRODUCE

Isaac Wolf, Herzlia, and Yekutiel Alper, Rishon Le Zion, both of Israel, assignors to State of Israel, Ministry of Agriculture, Beit Dagan, Israel

Filed Sep. 13, 1982, Ser. No. 417,610
Claims priority, application Israel, Sep. 14, 1981, 63818
Int. Cl.³ A01D *46/00*
U.S. Cl. 56—327 R **14 Claims**



1. Harvesting apparatus for produce comprising:
a chassis;
a pick-up and primary separation assembly mounted on said chassis and including first and second helical elements between which plants will pass, each first and second elements including an elongate helical portion and a tip portion;
side conveyors for raising produce separated by said pick-up and primary separation assembly; and
separation means including rollers for grasping at least a portion of a plant raised by said pick-up and primary separation assembly and adjacent rotating apparatus for engaging the produce thereon for separation thereof from the plant,
said rotating apparatus comprising first and second pairs of rotating bar assemblies, each of said rotating bar assemblies comprising an axle defining a rotational axis, first and second elongate side bars arranged in spaced orientation along a transverse axis perpendicular to said rotational axis,
one of the rotating bar assemblies in each of said first and second pairs being arranged for 90° out of rotational phase relative to the second rotating bar assembly;
each of said first and second pairs of rotating bar assemblies being arranged to receive between the bar assemblies of the pair at least a portion of the plant for engaging the produce thereon.

4,507,912

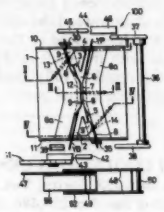
PNEUMATIC YARN SPLICING APPARATUS

Kazuyoshi Noguchi, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Oct. 26, 1982, Ser. No. 436,776
Claims priority, application Japan, Oct. 27, 1981, 56-171583; Oct. 27, 1981, 56-171584
Int. Cl.³ B65H *69/06;* D01H *15/00;* D02J *1/08*
U.S. Cl. 57—22 **14 Claims**

1. An apparatus for splicing spun yarns including a nozzle block having opposed sides and means for applying a jet fluid stream to the overlapped, untwisted yarn ends which are introduced from the opposite sides of said block, characterized in that a generally X-shaped guide groove is formed in the nozzle block, the guide groove comprising a first yarn end introducing groove, a first yarn end untwisting groove having an untwisting zone, a second yarn end introducing groove, a second yarn end untwisting groove having an untwisting zone and a splicing groove having an intertwining zone for splicing the overlapped, untwisted yarn ends, the intertwining zone being positioned at the intersecting portion of the X-shaped guide groove, the untwisting and splicing grooves positioning and supporting the yarn ends to be spliced and being provided in a common plane.

10. An apparatus for splicing spun yarns comprising a nozzle block including:



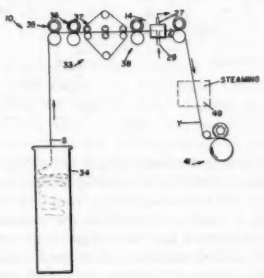
means for untwisting yarn ends to be spliced,
means for intertwining untwisted yarn ends, and
first, second and third grooves for positioning and supporting yarns to be spliced in a common plane, the first and second grooves communicating with the third groove, the first groove having a zone where untwisting of the free end of a yarn to be spliced occurs, the second groove having a zone where untwisting of the free end of another yarn to be spliced occurs, the third groove having a zone where intertwining of untwisted free yarn ends occurs.

4,507,913

VACUUM SPINNING

Elbert F. Morrison, Clarksville, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jun. 7, 1982, Ser. No. 386,078
Int. Cl.³ D01H *5/28, 1/12, 1/13;* D02G *1/04*
U.S. Cl. 57—328 **16 Claims**



1. Apparatus for forming yarn, comprising:
a hollow shaft, at least a portion of the entire circumference of which is perforated;
means for mounting said shaft for rotation about an axis;
means for rotating said shaft about its axis;
means for passing textile fibers through the interior of said shaft linearly, generally along the axis of rotation thereof, the fibers being fed into a first end thereof;
means for applying a vacuum to the exterior of said shaft so that at least some of the fibers or free ends of fibers passing through said shaft will draw toward the shaft perforations,

and will be caused to rotate with said shaft as said fibers move linearly generally along the axis of rotation; and

means for withdrawing formed yarn from a second end of said shaft, opposite said first end thereof.

12. A method of spinning yarn comprising the steps of:

feeding a plurality of free fibers having a staple length of about one inch to 6 inches in a linear direction A, in a fiber mass;

passing the fiber mass into the interior of a hollow shaft rotatable about an axis generally coincident with the direction A, the shaft having perforations along the entire circumference of at least a portion thereof;

applying a vacuum to the exterior of the perforated portion of the shaft circumference sufficient to attract the fiber mass inside the shaft toward the shaft interior surface; and

rotating the shaft at high speed so that the fibers interior of the shaft rotate with the shaft as they are moving in the direction A, the rotation fully controlling fiber interengagement to produce a final yarn.

4,507,914

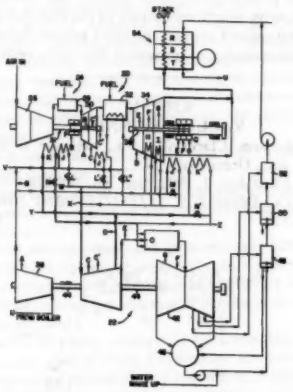
STEAM COOLED GAS GENERATOR

Ivan G. Rice, P.O. Box 233, Spring, Tex. 77373

Continuation-in-part of Ser. No. 224,496, Jan. 13, 1981, Pat. No. 4,438,625, and Ser. No. 274,660, Jun. 17, 1981, Pat. No. 4,384,452, which is a division of Ser. No. 47,571, Jun. 11, 1979, Pat. No. 4,314,442, said Ser. No. 224,496, is a division of Ser. No. 954,832, Oct. 26, 1978, Pat. No. 4,272,953. This application Sep. 9, 1982, Ser. No. 416,275

Int. Cl.³ F02C *7/16*

U.S. Cl. 60—39.17 **58 Claims**



1. A gas generator comprising; a means to compress ambient air including a plurality of rotating blades, a combustor communicating with and downstream from said compressor means for igniting a combustible fuel in the presence of said compressed air to form a first heated gas, a gas turbine communicating with and downstream from said combustor, said gas turbine comprising a rotating shaft and associated turbine blading to turn said shaft upon contact of said first heated gas with said turbine blading, said compressor means containing a compressor shell which confines said ambient air and said plurality of rotating blades, said compressor shell comprising an inner casing in contact with said ambient air and an outer casing annularly spaced from said inner casing, and a plurality of radial support struts positioned circumferentially around the surface of said outer casing and spaced along the length of said compressor shell, said radial support struts extending radially from a location adjacent to said inner casing to a point beyond said outer casing, said outer casing containing therein a hollow steam chamber, each of said radial support struts containing an elongated steam chamber, a source of steam, means to control a supply of steam from said source through said hollow steam chambers contained in said outer casing and to said elongated steam chambers in said radial support struts so as to effect heat exchange between said compressor shell and said steam and control the tip clearance between said rotating blades within the compressor shell and said inner casing.

4,507,915

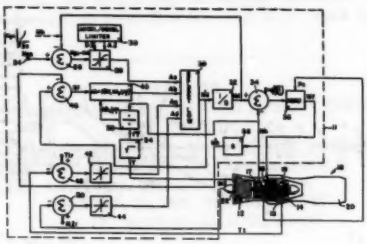
STALL DETECTOR AND SURGE PREVENTION FEATURE FOR A GAS TURBINE ENGINE

Rowland M. Evans, Terrasse Vaudreuil, Canada, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 259,317, Apr. 30, 1981, Pat. No. 4,449,360. This application Jan. 25, 1984, Ser. No. 573,542

Int. Cl.³ F02C *9/28*

U.S. Cl. 60—39.281 **12 Claims**



1. A fuel control system for a gas turbine engine comprising:

means for generating an actual speed signal proportional to the actual turbine speed of the gas turbine engine;

means for generating a scheduled speed signal proportional to a desired output power;

means for generating a demanded speed signal proportional to the time integral of a difference signal;

means for generating said difference signal proportional to the difference between said scheduled speed signal and said demanded speed signal;

means for generating an error signal proportional to the difference between said demanded speed signal and said actual speed signal;

means for controlling the fuel flow to the gas turbine engine as a function of said error signal;

means responsive to the actual speed signal and the demanded speed signal for generating a stall factor as a function of the difference between actual speed signal and the demanded speed signal and indicative of the degree of stall the engine is experiencing; and

means, responsive to the stall factor, to further control fuel flow to the gas turbine engine.

4,507,916

WIND GENERATING MEANS

Max F. Anderson, R.R. #1, Stewardson, Ill. 62463

Continuation-in-part of Ser. No. 53,828, Jul. 2, 1979, Pat. No. 4,442,887, and a continuation-in-part of Ser. No. 547,479, Oct. 31, 1983,. This application Apr. 9, 1984, Ser. No. 598,383

Int. Cl.³ F03G *7/00*

U.S. Cl. 60—641.1 **10 Claims**

1. In a system for obtaining air movement, the combination comprising,

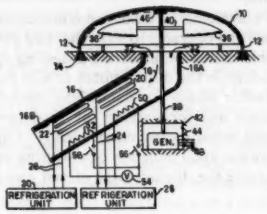
a dome,

means for supporting the dome on the earth,

air inlet means for providing air from a location outside said system to a location beneath the dome,

a passage or tunnel in the earth having an air inlet beneath the dome and an air outlet outside the dome at a level beneath the level of the tunnel or passage air inlet, and

refrigeration means including a cooling element for cooling air in said passage or tunnel and providing for gravity



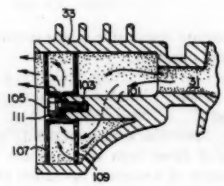
flow of cooled air down the passage or tunnel from the inlet to the outlet thereof.

4,507,917

ECONOMICAL ENGINE CONSTRUCTION HAVING INTEGRALLY CAST MUFFLER

William C. Kandler, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Division of Ser. No. 188,135, Sep. 17, 1980, Pat. No. 4,380,216.
This application Sep. 27, 1982, Ser. No. 423,800
Int. Cl.³ F01N *7/10*
U.S. Cl. 60—323 **4 Claims**



1. An internal combustion engine comprising: a cast block including an exhaust passage cast integrally with the block and extending from a combustion cylinder of the engine, a muffler comprising a plurality of baffle plates and a muffler shell positioned at an end of said exhaust passage and being cast integrally with said exhaust passage and block, said shell defining an enlarged cavity enclosing ail of said baffle plates, said integrally cast shell being substantially closed on all sides except an inlet side communicating with said passage and an exhaust side through which exhaust gasses escape to the atmosphere, and fastener means connected to said cast muffler shell for connecting said baffle plates to said shell, wherein said shell further includes a boss integrally cast with the shell and being within the cavity terminating near an open end of the cavity, and said fastener means is connected to the boss.

4,507,918

RECIPROCATING PISTON COMPRESSED FLUID ENGINE HAVING RADIAL CYLINDERS AND TRIGGERABLE VALVES

John E. Holleyman, 3402 Polk St., Monroe, La. 71201

Filed Oct. 13, 1983, Ser. No. 541,533
Int. Cl.³ F16D *31/02;* **F01B** *13/06*
U.S. Cl. 60—370 **2 Claims**

1. A multiple piston and cylinder type engine driven by a compressed fluid, comprising in combination,

a crankshaft,

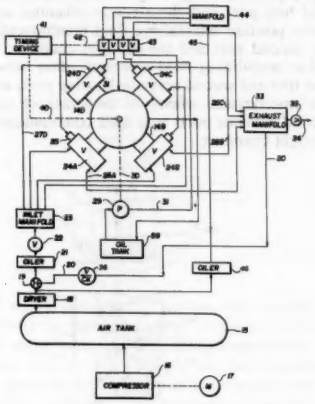
a rotatable plate assembly mounted to rotate the crankshaft,

a set of reciprocatable pistons moving in cylinders arranged generally radially about the crankshaft and connected to the rotatable plate by piston rods for rotating it and thereby the crankshaft,

a fluid source for supplying fluid under pressure,

a set of triggerable valves connected for control of fluid to and from said cylinders, resident in an exhaust position and movable to an intake position admitting said fluid under pressure from said source by a fluid pressure triggering force,

rotary distributor means synchronously driven by the crankshaft for coupling fluid pressure from said source to trigger said valves into the intake position in a sequence and



timing to convert the fluid source pressure into crankshaft rotation power,

a venturi connector in a motive fluid supply line leading to the cylinders thereby to produce temporarily a lower energy mixing region for merging exhaust fluid into the motive fluid flow path at a transit point of substantially equalized pressure and returning the pressure to substantially that of the source fluid for driving said pistons,

and a feedback conduit coupled through a check valve to recirculate a part of the exhaust fluids passing through the valves at the pressure of the mixing region into the fluid flow path to supplement the fluid from said source.

4,507,919

FAIL SAFE ACTUATOR

Russell G. Smith, 2805 Digby Ave., Cincinnati, Ohio 45220

Continuation of Ser. No. 120,055, Feb. 11, 1980, abandoned.
This application May 17, 1982, Ser. No. 379,068
The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.
Int. Cl.³ F15B *1/06, 11/15, 13/042*
U.S. Cl. 60—404 **5 Claims**

1. A fail safe actuator, comprising:

(a) encapsulating means for providing an air-tight chamber isolated from the external environment, said air-tight chamber containing a pressurized fluid isolated from ambient pressure;

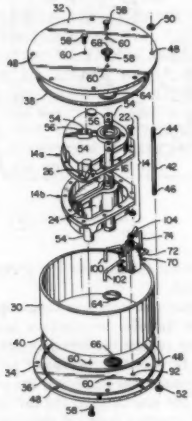
(b) an actuator housing completely disposed within said air-tight chamber, said housing having first and second ports, each of said first and second ports selectively communicating with both the air-tight chamber and the ambient environment;

(c) an actuating element movably disposed within said actuator housing, said actuating element being movable to a first position in response to the introduction of a pressurized fluid media into said first actuator housing port and movable to a second position in response to the introduction of pressurized fluid media into said second actuator housing port;

(d) a rotary drive shaft extending between the air-tight chamber and the ambient environment through said encapsulating means, said drive shaft being interconnected to said actuating element and being rotatably movable in response to movement thereof;

(e) a rotary seal between said rotary drive shaft and said encapsulating means, said rotary seal being operative to maintain a pressure differential between the air-tight chamber and the ambient pressure;

(f) a four-way control valve disposed within said air-tight chamber, said control valve being movable between a first valve position establishing fluid communication between said first port and the air-tight chamber and a second valve position establishing fluid communcation between the second port and the air-tight chamber, said control valve establishing fluid communication between one of said first and second actuator housing ports and the ambient environment whenever the other of said first and second actuator ports is in fluid communication with the air-tight chamber;



(g) means for biasing said control valve toward said first valve position;

(h) unidirectional flow means for permitting flow of pressurized fluid media to said air-tight chamber; and

(i) means for directing a pressurized fluid media to both the control valve and the unidirectional flow means, said directing means serving to pressurize the air-tight chamber and to move the control valve to the second position against the resilient biasing means whenever the pressurized fluid media exceeds a predetermined pressure, the control valve being movable to said first position only when the pressurized fluid media falls below the predetermined level, whereby the entire actuator housing and control valve are protected in the air-tight chamber from impact and environmental damage and the control valve is cyclicly movable in response to pressure fluctuations in a pressurized fluid media above and below the predetermined pressure to control the position of the drive shaft.

4,507,920

STEERING CONTROL APPARATUS

Jim L. Rau, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed May 19, 1982, Ser. No. 379,968
Int. Cl.[3] F16D *33/00, 33/02*
U.S. Cl. 60—443 **10 Claims**

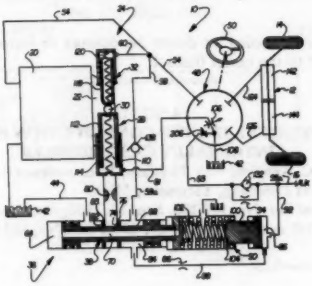
1. An apparatus for effecting operation of a steering motor to turn a steerable vehicle wheel, said apparatus comprising

a variable displacement pump,

fluid pressure responsive motor means connected with said pump for varying the displacement of said pump in response to variations in fluid pressure conducted to said motor means,

valve means connected in fluid communication with said motor means and operable to vary the fluid pressure conducted to said motor means during a steering operation to effect variations in the displacement of said pump,

steering controller means for controlling operation of the steering motor and for varying the fluid pressure conducted to said motor means independently of operation of said valve means upon initiation of a steering operation to thereby increase the displacement of said pump,



said fluid pressure responsive motor means including a variable volume chamber,

conduit means for conducting a pilot flow of fluid from said variable volume chamber to said steering controller means, and

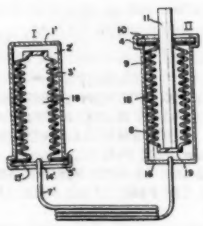
said steering controller means including means for restricting the pilot flow from said variable volume chamber upon initiation of a steering operation to thereby increase fluid pressure in said variable volume chamber to provide for increase in the displacement of said pump in response to the initiation of the steering operation.

4,507,921

THERMOSTATIC SENSOR AND METHOD OF MAKING SAME

Gosta Hammarstedt, Alstermo-SE, Sweden, assignor to Arcu Armaturindustri AB, Alstermo, Sweden

Continuation-in-part of Ser. No. 186,409, Sep. 11, 1980, abandoned. This application May 19, 1983, Ser. No. 496,181
Claims priority, application Sweden, Sep. 17, 1979, 7907684
Int. Cl.[3] F03G *7/06*
U.S. Cl. 60—527 **3 Claims**



1. A thermostatic sensor for use for remote control in a predetected temperature range, comprising a sensor section and an actuator section, each of said sections comprising a substantially non-elastic cup-like vessel with a compressible bellows

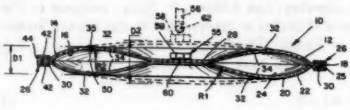
consisting of a blow-molded plastic, and operable to be moved between expanded and collapsed limits, said blow-molded plastic bellows having a series of inner and outer folds connected by conical walls, said inner folds being radially and axially offset from the outer folds, the plastic in said conical walls being of greater thickness than the plastic in said folds, a washer with a gasket to hermetically seal the space between the vessel and the bellows in the sensor section and to close the space between the vessel and the bellows in the actuator section, and displaceable means displaced in response to movement of said bellows in the actuator section for the accomplishment of governing movements in a mechanical device, said hermetically-sealed space being filled with a medium with high coefficient of thermal expansion, said medium being a wax or a composite wax of a selected type which changes state within said preselected temperature range, the inner space of the bellows in the sensor section being filled with a transfer fluid, a capillary tube communicating said inner space with the closed space between bellows and vessel in the actuator section, said displaceable means comprising a piston in the actuator section inside of its bellows and extending outwardly through its washer.

4,507,922

THERMOSTATIC ASSEMBLY

Stanley Kolt, Mamaroneck, N.Y., assignor to Leonard W. Suroff, Jericho, N.Y., a part interest

Filed Nov. 30, 1981, Ser. No. 325,659
Int. Cl.³ F03G 7/06
U.S. Cl. 60—531 **28 Claims**



1. An assembly having a heat expansible fluid therein and capable of expanding and contracting in response to temperature changes between predetermined limits, said assembly comprising:

A. a first member having a front surface and a rear surface with said surfaces terminating in a free end,

B. a second member having a front surface and a rear surface with said surfaces terminating in a free end,

C. sealing means to provide a fluid tight connection of said members at said free ends thereof so as to permit the expansion of the fluid therein such that said first member expands to generate a force in response to temperature changes of the assembly, and

D. said sealing means including

(1) a ring circumferentially extending around said free ends of said members and in partially overlapping relationship to said outer surface of each one of said members, and

(2) a sealent extending intermediate said ring and said members so as to maintain the fluid tight seal therebetween.

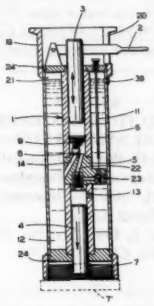
4,507,923

HYDRAULIC DEVICE

Thomas D. Trabbic, Fuerstenberger Strasse 231, 6 Frankfurt-/Main, Fed. Rep. of Germany

Continuation of Ser. No. 215,703, Mar. 19, 1981, abandoned. This application Jun. 17, 1983, Ser. No. 504,849
Int. Cl.³ F15B 7/00
U.S. Cl. 60—583 **14 Claims**

1. A hand held hydraulic drive unit comprising, in combination, an outer elongate casing, a fixed inner elongate casing disposed within said outer casing, said inner casing defining first and second chambers, a pair of opposed end means extending between said inner and said outer casings for defining a fluid reservoir, a first piston slidably disposed within said first chamber, pivot means disposed on one of said pair of opposed end means, lever means coupled to said pivot means and said first piston for manually reciprocating said first piston, first check valve means for providing unidirectional fluid flow from said fluid reservoir to said first chamber, a second piston slidably disposed within said second chamber, said second piston extendible beyond the other of said pair of opposed end means, second check valve means for providing unidirectional fluid flow from said first chamber to said second chamber, and return valve means activated by said lever means for selectively establishing communication between said second chamber and said reservoir.

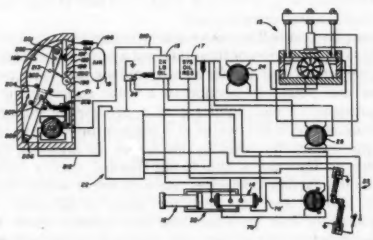


4,507,924

SYSTEM FOR EFFICIENTLY CONVERTING HYDROCARBONS INTO POWER

Charles W. Hemphill, 1106 Green Valley La., Duncanville, Tex. 75116

Filed Apr. 15, 1982, Ser. No. 368,541
Int. Cl.³ F02B 71/04
U.S. Cl. 60—595 **44 Claims**



1. A system for efficiently converting hydrocarbons into work comprising the combination of an internal combustion engine, a hydraulic pump, and a hydraulic motor;

means by which said internal combustion engine is connected to drive said hydraulic pump;

a system oil reservoir; a power oil accumulator; said hydraulic motor having a power oil inlet connected to said power oil accumulator and a power oil outlet connected to said system oil reservoir;

an auxiliary hydraulic pump means connected to said accumulator for increasing the pressure therein to a predetermined value, when the pressure is reduced below said value; and means connected to said power oil accumulator, said system oil reservoir, and said auxiliary hydraulic pump for cycling said engine into position for delivering a

power stroke, whenever said engine fails to deliver a power stroke upon demand;

said hydraulic motor having a rotor journaled for axial rotation within a housing, vanes reciprocatingly received within and radiating from the rotor; means by which said power oil inlet and said power oil outlet convey power oil to and from the interior of the housing; and a variable enclosure means circumferentially positioned about said vanes;

said variable enclosure means froms a peripheral wall surface against which the outer ends of the vanes bear, and which is movable from a low power cylindrical configuration into a high power elliptical configuration.

4,507,925

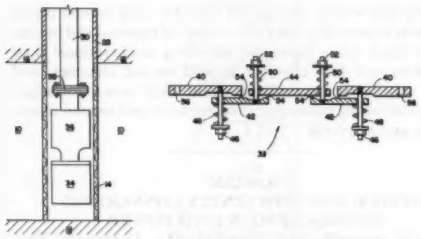
METHOD FOR AND THERMAL ENERGY INJECTION WITHDRAWAL SYSTEM FOR AQUIFERS

Walter J. Schaetzle, P. O. Box 1523, Tuscaloosa, Ala. 35403; C. Everett Brett, 93 Canyon Rd., Tuscaloosa, Ala. 35406, and Jasem M. Al-Ansari, Dhahran International Airport, P.O. Box 144, Dhahran, Saudi Arabia

Filed May 7, 1981, Ser. No. 261,650

Int. Cl.³ F03G *7/00*

U.S. Cl. 60—641.4 **15 Claims**



8. An apparatus for the control of water injection into said withdrawal of water from an aquifer via at least one well, comprising:

means for injecting thermal energy into and withdrawing thermal energy from said aquifer via said at least one well under water pressure; and

means for controlling said water pressure at a point of injection as a function of flow rate and a normal predetermined pressure of said aquifer so as to reduce the water pressure at said point of injection to a value equal to the static pressure of said aquifer plus a predetermined pressure required to inject water at a predetermined rate of flow into the aquifer wherein said means for injecting thermal energy into and withdrawing thermal energy from said aquifer further comprises one-way valve means mounted in said at least one well for water withdrawal with a relatively low pressure loss and second valve means mounted in said at least one well and operatively associated with said one-way valve means for throttling the water pressure during injection of water into the aquifer and for preventing cavitation.

4,507,926

ROTOR ROTATING DEVICE FOR DRIVING OR DRIVEN MACHINES

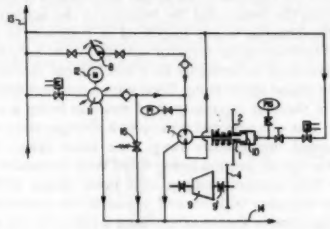
Hermann Teckentrup, Oberasbach, and Wilhelm Hoffmann, Nuremberg, both of Fed. Rep. of Germany, assignors to AEG-Kanis Turbinenfabrik GmbH, Nuremberg, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,238

Int. Cl.³ F01K *25/08*

U.S. Cl. 60—656 **8 Claims**

1. Rotor rotating device connected to an oil supply system, for turning the rotor of a rotary machine, which rotor is fitted with a gear wheel, said device comprising: a hydraulic motor; a hub mounted to be rotated by said motor; a pinion mounted on said hub and dimensioned to mesh with the gear wheel; a screw shift drive operatively associated with said pinion for permitting movement of said pinion in the direction of the axis of rotation of said hub between a first position in which said



pinion is disengaged from the gear wheel and a second position in which said pinion meshes with the gear wheel; a compression spring disposed to urge said pinion toward said first position; and a piston connected to said pinion and arranged to be actuated by oil under pressure from the oil supply system for moving said pinion into said second position.

4,507,927

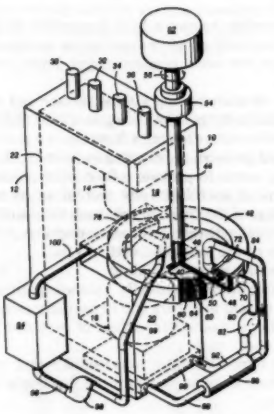
LOW-TEMPERATURE MAGNETIC REFRIGERATOR

John A. Barclay, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 26, 1983, Ser. No. 498,434

Int. Cl.³ F25B *5/00*

U.S. Cl. 62—3 **17 Claims**



1. An about 4 to about 20 K. refrigeration apparatus comprising:

a generally U-shaped housing having a base and two arms, said housing comprising electromagnets on the insides of the tips of the arms, said electromagnets being spaced opposed to one another;

a hermetically sealed container, said container comprising a wheel-shaped part and a rotatable driveshaft enclosing drive post shield perpendicular thereto at the center thereof, said wheel-shaped part comprising a rotatable rim portion, said rim portion containing a ring of fluid contactable magnetic material disposed therein, said driveshaft

and said ring being substantially frictionlessly rotatable within said container;

means for affixing said driveshaft within said drive post shield to said ring of magnetic material;

means for rotating said driveshaft and thereby rotating said ring of magnetic material at a selected speed;

first means for heat exchange comprising means for contacting a first fluid with a first portion of said ring of magnetic material disposed substantially outside a magnetic field produced by said electromagnets; and

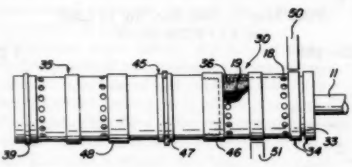
second means for heat exchange comprising means for contacting a second fluid with a second portion of said ring of magnetic material disposed inside said magnetic field.

4,507,928

RECIPROCATING MAGNETIC REFRIGERATOR EMPLOYING TANDEM POROUS MATRICES WITHIN A RECIPROCATING DISPLACER

Dean L. Johnson, Arcadia, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 9, 1984, Ser. No. 588,164
Int. Cl.³ F25B 21/02
U.S. Cl. 62—3 **18 Claims**



1. A method of operating a magnetic refrigerator having an object to be cooled at one temperature extreme in heat transfer relationship to a fluid medium, a heat sink adapted for heat transfer with a fluid medium at a second and higher temperature extreme, and a magnetic coil for producing a localized magnetic field, the method comprising the steps of:

coaxially aligning at least a pair of spaced paramagnetic substances on a movable displacer;

warming one of the paramagnetic substances by placing it in a constantly energized magnetic field while cooling the other paramagnetic substance to a lower temperature than the first by locating it outside the localized magnetic field; and

simultaneously flowing two separate fluid medium streams through both of the paramagnetic substances for achieving a heat exchange at both of said temperature extremes.

4,507,929

METHOD AND INSTALLATION FOR MONITORING THE TEMPERATURE IN A GREENHOUSE

José J. Dozier, Montigny-Le-Tilleul, Belgium, assignor to Delta Recherche et Developpement, Sion, Switzerland

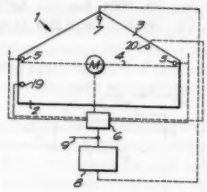
PCT No. PCT/BE82/00001, § 371 Date Oct. 20, 1982, § 102(e) Date Oct. 20, 1982, PCT Pub. No. WO82/02816, PCT Pub. Date Sep. 2, 1982
PCT Filed Feb. 12, 1982, Ser. No. 438,854
Int. Cl.³ F25B 27/02; A01G 9/00
U.S. Cl. 62—79 **9 Claims**

1. A method for regulating the temperature in a greenhouse by insufflation of cooled air into the upper portion of the greenhouse, and by heating of the lower portion of the greenhouse, comprising the steps of:

(a) aspirating warm air from the upper portion of the greenhouse;

(b) cooling the aspirated air by about 5° to 15° C. by means of a heat pump provided with a thermal reservoir for the storage of the energy removed from said warm air;

(c) mixing the cooled air with fresh air and returning it to a different point in the upper portion of the greenhouse; and



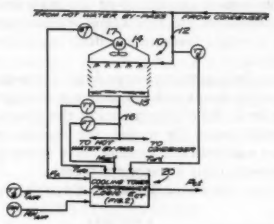
(d) circulating warm fluid from the thermal reservoir through at least one low temperature heating circuit located within said greenhouse.

4,507,930

COOLING TOWER MONITOR

Azmi Kaya, Akron, and Alan C. Sommer, Mentor, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 23, 1984, Ser. No. 592,504
Int. Cl.³ G01K 13/00
U.S. Cl. 62—129 **4 Claims**



1. A cooling tower monitor for determining the performance of a cooling tower having a hot water inlet, a cold water outlet and airflow means for producing an air flow through the tower, comprising:

wet bulb temperature means for determining the wet bulb temperature of air outside the tower;

available water flow means connected to said wet bulb temperature means for calculating available flow of water from the tower as a function of a rating factor and tower unit at standard conditions as well as cold water outlet temperature, hot water inlet temperature and air flow through the tower;

a first temperature transmitter connected to said available water flow means for supplying a signal corresponding to the cold water outlet temperature;

a second temperature transmitter connected to said available water flow means for supplying a hot water inlet temperature;

an air flow transmitter connected to said available water flow means for supplying an air flow value;

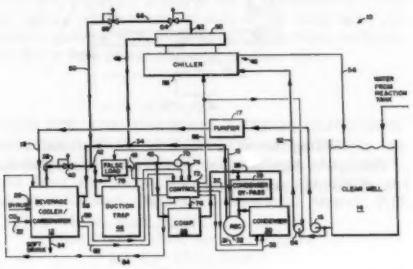
a water flow transmitter for generating a signal corresponding to an actual flow of water out of the tower; and

a performance value generator connected to said available water flow means and said water flow transmitter for calculating a performance value of the cooling tower as a function of the available and actual water flow out of the tower.

4,507,931
BOTTLING PLANT COOLING SYSTEMS

Billy E. Barrow, Sharpsburg; William E. Barrow, Newnan, and Michael A. Barrow, Senoia, all of Ga., assignors to Barrow Systems, Inc., Sharpsburg, Ga.

Filed Jun. 29, 1984, Ser. No. 625,993
Int. Cl.³ B01F *3/04*; F25B *41/04*
U.S. Cl. 62—175 **1 Claim**



1. A refrigeration system comprising:

(a) compressor units individually controllable and each connected to a high pressure manifold and a suction manifold;

(b) cooler means connected to the high pressure manifold and connected via a constant pressure cooler regulator to the suction manifold;

(c) chiller means connected to the high pressure manifold and connected via a constant pressure chiller regulator and a constant pressure manifold regulator to the suction manifold;

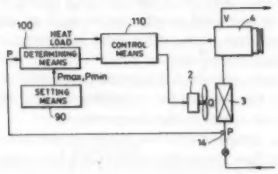
(d) means for supplying water from a common reservoir to the cooler means and the chiller means and for returning water from the chiller means to the common reservoir;

(e) control means for monitoring suction pressure in the suction manifold and turning on or turning off individual compressor units in response thereto.

4,507,932
CONTROL SYSTEM FOR AIR CONDITIONING SYSTEMS

Nobuhiko Suzuki; Shinji Sutoh, and Masaya Sasaki, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1984, Ser. No. 577,137
Claims priority, application Japan, Feb. 14, 1983, 58-22525
Int. Cl.³ F25D *17/00*
U.S. Cl. 62—180 **9 Claims**



1. In a control system for an air conditioning system of the type including a compressor variable in capacity, blower means variable in air quantity to be supplied therefrom, an evaporator for cooling and dehumidifying air supplied from said blower means, said evaporator having a boiling pressure thereof variable in response to the capacity of said compressor and an air quantity supplied from said blower means, said control system being adapted to control the boiling pressure of said evaporator and having sensor means for detecting the boiling pressure of said evaporator, setting means for setting an upper limit and a lower limit defining a predetermined range of the boiling pressure of said evaporator, and determining means for determining whether or not the boiling pressure of said evaporator has reached either said upper limit of said predetermined range or said lower limit thereof;

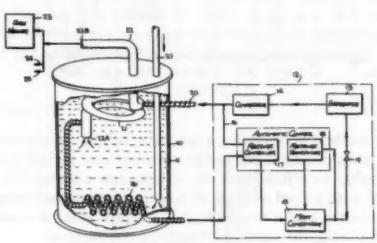
the improvement comprising:

control means operable to control the capacity of said compressor over a maximum variable range thereof and simultaneously control the air quantity supplied from said blower means so that the boiling pressure of said evaporator is maintained at one of said upper limit of said predetermined range and said lower limit thereof, when it is determined by said determining means that a value of the boiling pressure of said evaporator detected by said sensor means has reached said one of said upper limit of said predetermined range and said lower limit thereof.

4,507,933
SYSTEM COMBINING WATER HEATER AND REFRIGERATION UNIT

Roman Chapa, 93 Greenhaven Rd., Rye, N.Y. 10580, and Ronald Baumgarten, New York, N.Y., assignors to Roman Chapa, Rye, N.Y.

Filed May 5, 1980, Ser. No. 147,265
Int. Cl.³ F25B *39/04*
U.S. Cl. 62—184 **1 Claim**



1. A thermally-integrated system comprising:

A. a compressor-type refrigeration unit including an internal line conducting a refrigerant in hot vapor form from a compressor to a normally-inactive main condenser, the refrigerant from the main condenser going through an expansion valve into an evaporator which returns the refrigerant to the compressor;

B. a water heater tank including an inlet pipe feeding relatively cool incoming water into the lower region of the tank, and on outlet pipe drawing heated water from the upper region of the tank;

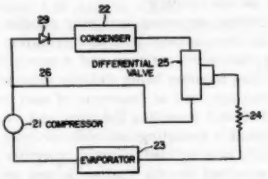
C. an external line functioning as an auxiliary condenser, said external line running from the compressor to the main condenser through the water tank, the external line entering the tank in the upper region thereof where it passes through a water jacket interposed in the outlet pipe to serve as a heat booster, the external line then going to the lower region where it is coiled to define a heater exchanger to heat the water and condense the hot vapor; and

D. means to render said main condenser active when the water temperature in the tank is too high to effect condensation of the hot vapor by the auxiliary condenser, said means including a pressure-responsive transducer coupled to the output of the main condenser to produce a control signal when the tank water temperature exceeds a predetermined level and a motor-driven fan responsive to said control signal to activate said main condenser.

4,507,934
REFRIGERATING SYSTEMS HAVING DIFFERENTIAL VALVE TO CONTROL CONDENSER OUTFLOW

Tatsuo Tanaka, Fuji, and Toshiaki Kawamura, Shimizu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 11, 1983, Ser. No. 493,766
Claims priority, application Japan, May 26, 1982, 57-89267
Int. Cl.³ F25B *41/04*
U.S. Cl. 62—210 **5 Claims**



1. A refrigerating system comprising a compressor, a condenser, a capillary tube, and an evaporator, which are connected in series for circulating a refrigerant therethrough, said refrigerating system further comprising:

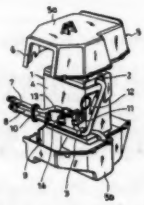
a check valve provided on an inlet side of said condenser for preventing a reverse flow of the refrigerant from said condenser to said compressor; and

a differential valve having a first port connected with a delivery side of the condenser, a second port connected with an inlet side of said capillary tube, a third port connected with a delivery side of said compressor, and means for interrupting flow of the refrigerant from said first port to said second port when a pressure of the refrigerant at the first port is higher than that of the refrigerant at the third port.

4,507,935
OVERHEAT DETECTING DEVICE OF AN AIR CONDITIONING SYSTEM FOR AUTOMOTIVE VEHICLES

Michimasa Madarame, and Kaichi Ueda, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Saitama, Japan

Filed Apr. 22, 1983, Ser. No. 487,520
Claims priority, application Japan, Apr. 24, 1982, 57-59814[U]
Int. Cl.³ F25B *49/00*
U.S. Cl. 62—227 **9 Claims**



1. An air conditioning system for an automotive vehicle, comprising:

an evaporator installed in the passenger compartment of the vehicle;

an evaporator case accommodating said evaporator, said evaporator case having side surfaces thereof which have an air inlet opening and an air outlet opening formed therein;

said evaporator having an upstream side at which it receives air introduced into said evaporator case through said air inlet opening and a downstream side at which it delivers air from said evaporator case through said air outlet opening;

an inlet pipe connected to said evaporator for feeding refrigerant to said evaporator;

an outlet pipe connected to said evaporator for discharge or refrigerant from said evaporator, said outlet pipe extending along said upstream side of said evaporator and defining a detecting space interior of said outlet pipe, at least a portion of said outlet pipe being interior of said evaporator case; and

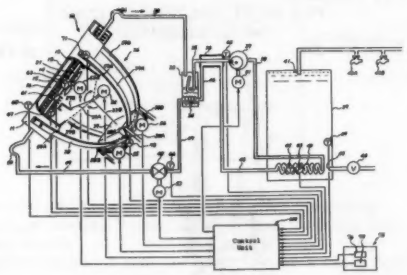
an overheat detecting device adapted to detect overheating of the refrigerant, said overheat detecting device being coupled to said outlet pipe on said upstream side of said evaporator and being accommodated within said evaporator case, said overheat detecting device being arranged opposite said air inlet opening said evaporator case, and said overheat detecting device comprising means defining a diaphragm chamber, a diaphragm disposed in said diaphragm chamber, said diaphragm having an exterior facing the inside of said diaphragm chamber and an oppositely disposed interior, a thermosensitive means arranged in said detecting space interior of said outlet pipe for detecting overheating of the refrigerant in said outlet pipe and communicating with said interior of said diaphragm, an enclosed space being defined by an interior portion of said thermosensitive means and said interior of said diaphragm, said enclosed space extending between said diaphragm chamber and said detecting space interior of said outlet pipe, and said diaphragm chamber communicating with said detecting space interior of said outlet pipe, said diaphragm having a displaceable portion which is displaceable in response to the difference between pressure in said enclosed space and pressure in said diaphragm chamber;

whereby said overheat detecting device is free from radiant heat emitted from the engine of said automotive vehicle, and is exposed to the air introduced into said evaporator case through said air inlet opening.

4,507,936
INTEGRAL SOLAR AND HEAT PUMP WATER HEATING SYSTEM

Hozo Yoshino, Tokyo, Japan, assignor to System Homes Company Ltd. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 19, 1983, Ser. No. 524,669
Int. Cl.³ F25B *27/00*
U.S. Cl. 62—235.1 **28 Claims**



1. A water heating system utilizing a condenser, comprising:

a solar evaporator including a heat collection chamber, first heat transfer means for receiving and transferring solar radiation heat, second heat transfer means receiving and transferring heat of ambient air, and an evaporator coil for passing refrigerant therethrough to perform heat ex-

change between said refrigerant and said first and second heat transfer means, thereby evaporating said refrigerant, said first and second heat transfer means and said evaporator coil being integrally incorporated in said heat collection chamber;

an accumulator with an accumulator coil by which the liquid refrigerant from said condenser rejects heat to the liquid refrigerant accumulated in said accumulator;

a compressor inlet heat exchanger for performing heat exchange between the liquid refrigerant from said condenser and the vapor refrigerant from said accumulator;

a variable speed pump/compressor connected to said solar evaporator for selectively circulating or compressing the vapor refrigerant from said evaporator;

a water storage tank for storing water;

said condenser being disposed on a bottom side in said water storage tank for passing the vapor refrigerant from said pump/compressor and for performing heat exchange between the water contained in said water storage tank and said vapor refrigerant and thus condensing said vapor refrigerant to liquid refrigerant;

a variable opening pressure regulating valve for selectively allowing passage or adiabatic expansion of the liquified refrigerant and supplying the refrigerant to said solar evaporator;

first and second pressure measuring means for measuring the saturated vapor pressure of the refrigerant passing through said solar evaporator and said in-tank condenser, respectively;

first, second, third, fourth and fifth temperature measuring means for measuring a suction side temperature of said pump/compressor, an inlet side temperature of said pressure regulating valve, a heat collection chamber temperature, an ambient air temperature and tank water temperature, respectively; and

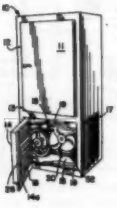
control means for controlling rotational speed of said pump-/compressor and opening of said pressure regulating valve so as to satisfy load demand and at least substantially maximize a coefficient of performance of the refrigeration cycle including said solar evaporator, said pump/compressor, said in-tank condenser and said pressure regulating valve, in response to pressures and temperatures measured by said first and second pressure measuring means and said first, second, third, fourth and fifth temperature measuring means.

4,507,937

VEHICLE REFRIGERATION UNIT AND MOUNTING ASSEMBLY

Frank E. Bretz, Elmhurst, Ill., assignor to Ajax Consolidated Co., Chicago, Ill.

Filed Jul. 11, 1983, Ser. No. 512,664
Int. Cl.³ F25D *19/00*
U.S. Cl. 62—298 **28 Claims**



1. An improved stationary refrigeration unit adapted to be installed in vehicles, the unit being of the type having a cooling compartment and a service compartment, comprising in combination:

a compartment for cooling articles stored therein below ambient temperature, said compartment having a door to gain access thereto;

a service compartment sharing a common wall with said cooling compartment and having a service compartment access opening along the same side of the unit as the cooling compartment access door, said service compartment including a motor and components driven thereby for cooling said cooling compartment to a temperature below ambient temperature, said motor having a drive shaft that is generally transverse to said service compartment access opening;

an adjustable mounting assembly rigidly mounted within said service compartment, said mounting assembly including a stationary carriage and a mounting member, said mounting member being slidably mounted to said stationary carriage, and at least one of said components is secured to said mounting member; and

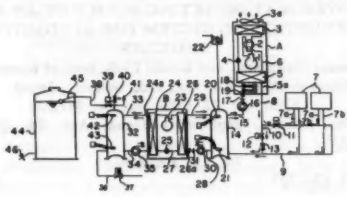
said adjustable mounting assembly includes means for longitudinally moving said mounting member and said component attached thereto relative to said stationary carriage, said moving means including a first shaft in driving engagement with said mounting member and a second shaft horizontally offset from said first shaft, said first shaft being in operative engagement with said second shaft whereby rotation of said second shaft rotates said first shaft and longitudinally moves said mounting member and said component attached thereto.

4,507,938

SYSTEM FOR AIR-CONDITIONING AND HOT WATER SUPPLYING

Hiroaki Hama, and Toshiro Abe, both of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,354
Claims priority, application Japan, Sep. 10, 1982, 57-159163
Int. Cl.³ F25B *13/00*
U.S. Cl. 62—324.1 **11 Claims**



1. An air-conditioning and hot water supply system, which comprises:

(a) a reversible heat pump type refrigerating device at the primary side having a user side heat-exchanger and a heat source side heat-exchanger with a coolant of excellent low temperature characteristic being filled in both of said user side heat exchanger and said heat source side heat exchanger;

(b) a refrigerating device at the secondary side having a user side condenser for heating water for hot water supply and a heat source side evaporator with a coolant of excellent high temperature characteristic being filled in both of said user side condenser and said heat source side evaporator;

(c) a circuit for air-conditioning, through which cold or warm water is caused to circulate between said user side heat exchanger of said primary side heat pump and said heat source side evaporator of said secondary side refrigerating device;

(d) a fan coil unit for air-conditioning communicatively connected with said circuit for air-conditioning,

(e) means for transporting said water in said circuit for air-conditioning from said user side heat exchanger of said

primary side heat pump to said fan coil unit and thereafter to said heat source side evaporator of said secondary side refrigerating device; and

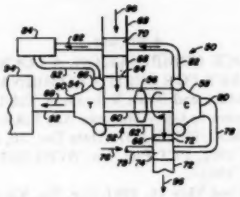
(f) circulating means for causing the circulation of said water in said circuit for air-conditioning.

4,507,939

THREE WHEEL CENTER FAN COOLING TURBINE APPARATUS AND ASSOCIATED METHODS

Kurt H. Wieland, Rolling Hills Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 16, 1983, Ser. No. 562,488
Int. Cl.³ F25D *9/00*
U.S. Cl. 62—402 **14 Claims**



1. An air cycle cooling machine comprising:

(a) shaft means;

(b) compressor means drivably secured to a first end portion of said shaft means;

(c) fan means drivably secured to a central portion of said shaft means;

(d) turbine means secured to a second end portion of said shaft means, said turbine means being rotationally drivable in response to passage therethrough of pressurized air from a source thereof to thereby rotationally drive said compressor means and said fan means;

(e) gas foil bearing means for supporting said shaft means; and

(f) means for utilizing a portion of the pressurized air flowing through said turbine means to continuously lubricate said gas foil bearing means,

said turbine means including a turbine housing, and said means (f) including means defining a flow path extending from within said turbine housing, through said gas foil bearing means, and into said fan means,

said bearing means including a gas foil thrust bearing axially supporting said shaft means, and a gas foil journal bearing rotationally supporting said shaft means, said thrust and journal bearings having communicating clearance spaces which together define a portion of said flow path.

4,507,940

AIR CONDITIONING APPARATUS OF THE TYPE EMBEDDED WITHIN A CEILING

Mineo Sato; Tadaaki Kawaguchi; Yukinori Okawachi, all of Wakayama, and Yasuyuki Funahashi, Kainan, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1982, Ser. No. 370,263
Claims priority, application Japan, Jul. 6, 1981, 56/101022
Int. Cl.³ F25D *17/04*
U.S. Cl. 62—407 **4 Claims**

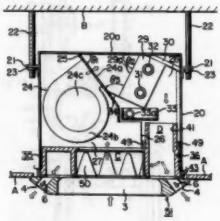
1. An air conditioning apparatus of the type for being embedded within a ceiling of a room, comprising:

a main body adapted to be mounted within a ceiling and having a horizontal top wall and substantially vertical side walls;

a partition means in the upper part of said main body dividing said upper part into a suction passage in the center and on one side of said main body and a single discharge passage on the other side of said main body;

a blower means contained in said suction passage and having the discharge thereof opening through said partition means, the discharge being angled upwardly with the plane across the end of the discharge being at an angle to said top wall;

a heat exchanger means contained in said discharge passage and positioned laterally in a horizontal direction from said blower means, the intake side thereof facing diagonally upwardly toward said blower means and forming a V with said plane across the end of said discharge of said blower means;



an annular chamber around the periphery of the lower part of said main body having the central opening thereof in communication with said suction passage and having the chamber in communication with said single discharge passage; and

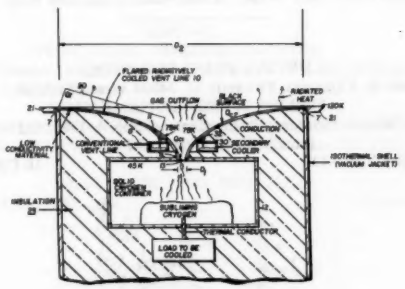
an exposed ceiling panel on the bottom of said annular passage having suction orifices at the middle thereof in communication with said central opening and discharge openings in communication with said annular chamber.

4,507,941

SOLID SUBLIMING COOLER WITH RADIATIVELY-COOLED VENT LINE

James M. Lester, Boulder; Richard P. Reinker, Arvada, and Douglas E. Regenbrecht, Boulder, all of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Apr. 22, 1983, Ser. No. 487,692
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **20 Claims**



1. A solid subliming cooler for use in space comprising:

a cryogen container having a cryogen vapor venting aperture therein;

a radiatively-cooled vent line means having a vapor flow passageway connected to said vapor venting aperture for radiating heat from an outwardly directed surface into space and away from the vent line means and away from said cooler as it is being conducted therealong towards said cryogen container; and

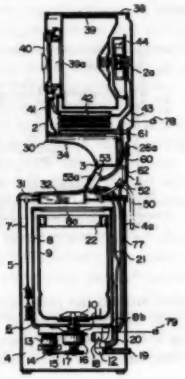
insulation means disposed on an inwardly directed side of said vent line means, opposite said outwardly directed surface, for reducing inwardly directed heat transfer.

4,507,942

WASHING MACHINE WITH DRIER

Etsuro Hirose; Kimio Takahashi, both of Hitachi; Toshiro Mori, Katsuta, and Haruyuki Kaito, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 3, 1981, Ser. No. 317,844
Claims priority, application Japan, Nov. 5, 1980, 55-154678
Int. Cl.[3] D06F *29/02*
U.S. Cl. 68—20 3 Claims



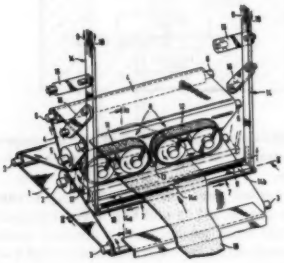
1. A washing and drying arrangement including a washing machine, a drier having a drier body, and a drier carrier mounted on said washing machine body for carrying the drier body, wherein substantially a whole portion of a front surface of said drier carrier is concaved rearwardly to form a concaved curved front surface, said concaved curved front surface having an opening formed in a lower front surface thereof for enabling clothes to be put in and removed from the washing machine body, a control panel means disposed rearwardly of the opening for operating at least some control means associated with the washing and drying arrangement, an upper front surface of said drier carrier and a front surface of said drier body are rearwardly offset from the lower front surface of said drier carrier, and a rear surface of said drier body is rearwardly offset from a rear surface of said washing machine body.

4,507,943

DRYING PRESS FOR HIDES

Antti K. Viljanmaa, Pirkantie 15, 34800 Virrat, Finland

Filed Sep. 2, 1982, Ser. No. 414,446
Claims priority, application Finland, Sep. 4, 1981, 812743
Int. Cl.[3] C14B *1/02, 1/30, 17/06*
U.S. Cl. 69—41 10 Claims



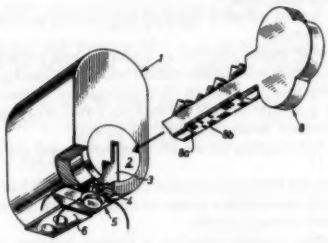
1. A drying press for hides, comprising an upper and a lower endless drying felt passed over rolls and pressed against each other by a pair of press rolls to form a drying press gap for hides which are passed therethrough, the lower drying felt extending upstream of the drying press gap, and hide stretching means positioned upstream of the gap and above the lower felt, said hide stretching means including a lower stretcher extending transversely relative to the lower drying felt, said lower stretcher being displaceable in the downstream direction, said lower stretcher serving to lift hides off the lower drying felt, and an upper stretcher which in the final position of the downstream displacement of said lower stretcher is located above the lower stretcher such that the upper and lower stretchers may grip hides therebetween and stretch hides in opposite transverse directions relative to the direction of feed of the hides.

4,507,944

CYLINDER LOCK COMBINATION, A LOCK CYLINDER AND A KEY FOR SUCH A COMBINATION

Bo Widén, Torshälla, and Björn Rubensson, Eskilstuna, both of Sweden, assignors to GKN-Stenman AB, Eskilstuna, Sweden

PCT No. PCT/SE81/00150, § 371 Date Dec. 30, 1981, § 102(e) Date Dec. 30, 1981, PCT Pub. No. WO81/03355, PCT Pub. Date Nov. 26, 1981
PCT Filed May 19, 1981, Ser. No. 336,383
Claims priority, application Sweden, May 20, 1980, 8003772
Int. Cl.[3] E05B *47/00*
U.S. Cl. 70—276 10 Claims



1. A cylinder lock-key combination comprising a cylinder housing (1) in which there is arranged a rotatable cylinder plug (2) having a key slot (3) for the key (8), and an electronic evaluating circuit (11–18) for establishing proper actuation of the cylinder, whereat the key (8) constitutes a carrier of coded information (8*a*, 8*b*) which can be read-off through a sensing means disposed proximate the cylinder housing and plug and connected to the electronic circuit, characterized in

that arranged proximate the cylinder lock is a magnetic body (5*k*) arranged to generate a magnetic flux which passes the key slot (3);

that the coded information on the key (8) is incorporated at locations or regions (8*a*, 8*b*, 8*c*) of mutually different magnetic permeability and positioned one after the other in the longitudinal direction of the key, said locations or regions causing variations in said magnetic flux when the key is moved longitudinally relative to the housing;

that the sensing means includes means (5) incorporated in an electric circuit containing a bridge coupling and supplied with an operational voltage, said means (5) being arranged to convert said magnetic flux variations to momentary changes in resistance, said changes causing such imbalance of the bridge coupling that there is generated in said circuit an electric pulse train corresponding to said coded information; and

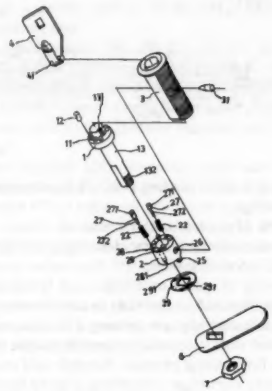
that connected to the circuit is a means, for example a data processing device (11), arranged to sense and evaluate said pulse train.

4,507,945

QUINCUNX-SHAPED LOCK DEVICE

Shih M. Hwang, P.O. Box 7-369, Taipei, 106, Taiwan

Filed Nov. 3, 1982, Ser. No. 438,727
Int. Cl.³ E05B *15/14, 27/08*
U.S. Cl. 70—363 **2 Claims**



1. An improved quincunx-shaped lock device comprising a lower pin seat, said lower pin seat having a plurality of lower pin holes therein, a plurality of lower lock pins springingly disposed in a respective said lower lock pin hole, the number of said lower lock pins corresponding in number to the number of said lower pin holes, said lower lock pins each including a pin head and a pin tail, each said lower lock pin having a differing length and differing cross-sectional diameter, the lower pin holes in said lower pin seat being furnished with pin-tail-through holes, a check ring, said check ring having notches therein such that when said lower lock pins are pushed downwardly, said pin tails penetrate either through just the pin-tail-through holes or through the notches in said check ring, while some of said pin tails touch said check ring and stop there.

4,507,946

METHOD AND SYSTEM FOR CONTROLLING AN INTERSTAND TENSION IN A CONTINUOUS ROLLING MILL

Toshihiro Koyama, Koganei; Yoshiharu Anbe, Kodaira, and Takuo Funahashi, Hino, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 19, 1983, Ser. No. 486,354
Claims priority, application Japan, Apr. 23, 1982, 57-68276
Int. Cl.³ B21B *37/00*
U.S. Cl. 72—17 **2 Claims**

1. A method for controlling an interstand tension in a continuous rolling mill having a looper provided between a pair of successive rolling stands and driven by a looper drive motor, said method comprising the steps of:

detecting the operating angle of the looper;

detecting the interstand tension;

determining, in accordance with a detected deviation of said detected operating angle from an angle target value, and in accordance with a detected deviation of said detected tension from a tension target value, a correction to a speed target value for speed feedback control of the looper drive motor and a correction to a speed target value for a roll drive motor driving one of the rolling stands between which the looper is provided;

the step of determination of a correction to the speed target value for the looper drive motor comprising the steps of:

determining a first correction from the deviation of the detected angle,

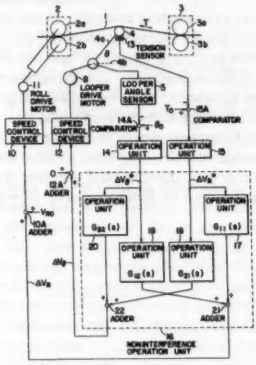
determining a second correction from the deviation of the detected tension, and

adding the first correction and the second correction to produce the correction to the speed target value for the looper drive motor;

the step of determination of the correction to the speed target value for the roll drive motor comprising the steps of:

determining a third correction from the deviation of the detected tension,

determining a fourth correction from the deviation of the detected angle, and



adding the third correction and the fourth correction to produce the correction to the speed target value for the roll drive motor;

the fourth correction being determined to be a value contributing to a variation in the speed of the roll drive motor cancelling the variation in the tension due to the variation in the angle due to the first correction; and

the second correction being determined to be a value contributing to a variation in the speed of the looper drive motor cancelling the variation in the angle due to the variation in the tension due to the third correction.

4,507,947

PUNCH AND WINDING MACHINE

Louis Stanley, Peakhurst Heights, assignor to Card-O-Matic Pty. Limited, Sydney

Filed Jul. 28, 1983, Ser. No. 518,137
Claims priority, application Australia, Aug. 4, 1982, PF5208; Oct. 21, 1982, PF6450; Dec. 23, 1982, PF7432; Mar. 31, 1983, PF8709
Int. Cl.³ H02K *15/02;* B21D *53/00*
U.S. Cl. 72—130 **7 Claims**

1. A punch and winding machine to manufacture a core for a rotor or stator of an axial flux induction electric machine, said core being formed of metal strip punched at longitudinally

spaced locations and wound about a central axis extending transverse of the strip so that holes punched in the strip form radially extending slots in a radial face of the core, said punch and winding machine comprising a frame, a punching assembly mounted on the frame to receive said strip and punch holes therein at predetermined intervals along the strip as the strip is drawn therethrough, a winding assembly to receive the punched strip and wind the strip to form a core, said punching assembly including punch means to punch a first and then a second deformation in a trailing portion of the strip, which trailing portion forms a last coil of the core, said first deformation being a first securing tab and said second deformation being a first securing hole, control means coordinating said punch assembly and winding assembly so that the slot holes in said strip form radially extending slots in said core and actuation of said first punching means so that the first and second deformations are longitudinally spaced along said strip by a predetermined distance to thereby radially align said securing tab with said securing hole so as to pass therethrough, and securing tab deformation means to engage said securing tab as it projects through said securing hole, to bend said securing tab back along the strip to thereby bind together the two radially outer coils of the core to inhibit relative movement therebetween.

4,507,948

METHOD AND APPARATUS FOR CUTTING CORRUGATED STRIP

Bernard J. Wallis, 25315 Kean Ave., Dearborn, Mich. 48124

Filed Nov. 4, 1983, Ser. No. 548,711
Int. Cl.³ B21D *53/02*
U.S. Cl. 72—185 **16 Claims**

1. In a machine wherein metal ribbon stock is corrugated transversely by feeding it lengthwise between a pair of toothed corrugating rolls and the corrugated strip is advanced to a rotary driven tooth feed roll in a lengthwise compacted condition wherein the number of convolutions per unit length is greater than desired in the finished strip, said feed roll being adapted to engage the strip between the crests of the successive corrugation and advance it lengthwise in a downstream direction, the improvement which comprises a rotary driven unpacking roll located downstream from the feed roll in the path of travel of the corrugated strip, said unpacking roll having regularly spaced teeth around its outer periphery adapted to engage between the crests of the convolutions of the corrugated strip to advance the strip further in a downstream direction, means permitting rotary adjustment of the unpacking roll relative to the feed roll while the latter is stationary to stretch the section of the corrugated strip engaged by and extending between the two rolls so that the number of convolutions per unit length in said stretched section is less than the number of convolutions per unit length in the portion of the corrugated strip upstream from said feed roll and means for locking the unpacking roll in said rotatably-adjusted position relative to the feed roll.

4,507,949

APPARATUS FOR COOLING A HOT-ROLLED PRODUCT

Daniel E. Killilea, Canton, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Feb. 12, 1982, Ser. No. 348,079
Int. Cl.³ B21B *45/02, 43/00*
U.S. Cl. 72—201 **15 Claims**

1. A cooling box for cooling product in a continuous hot-roll mill, comprising:

(a) a source of coolant under pressure;

(b) structure defining a frame defining a plurality of spaced, cartridge receiving slots;

(c) a plurality of guide cartridges and spray cartridges removably disposed in the slots in said frame;

(d) each guide cartridge comprising a housing engageable by one of said slots supporting a repositionable tapered guide element for guiding product through said cooling box;

(e) each spray cartridge comprising a spray housing engageable by one of said slots defining a spray passage therethrough and further comprising spray means communicating with a coolant chamber defined by said spray housing and operative to spray coolant onto product passing through said spray passage; and

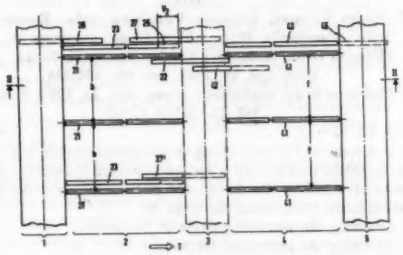
(f) conduit means for communicating said source of coolant under pressure with said spray cartridge.

4,507,950

CONVEYING MEANS FOR EXTRUSION PROFILES

Friedrich W. Elhaus, Dorfstr. 21, 7761 Moos, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 96,681, Nov. 23, 1979, abandoned. This application Mar. 29, 1982, Ser. No. 362,660
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 2933260
Int. Cl.³ B21C *35/00*; B65G *25/04*
U.S. Cl. 72—257 **11 Claims**



1. Conveying apparatus for conveying extrusion profiles (S) from the runout conveyor (1) of an extrusion press in a horizontal transfer direction (T) normal to the longitudinal extrusion axis of the press, comprising

(a) a cooling table station (2) including a plurality of coplanar parallel horizontally spaced fixed beams (21) arranged normal to the runout conveyor; and

(b) means for transferring an extrusion profile from said runout conveyor to said cooling station fixed beams, including

(1) a plurality of parallel transfer beam means (23) arranged

parallel with and between said fixed beams, each of said transfer beam means including

(a) a horizontal lift member (24);

(b) a transfer member (25) mounted for horizontal longitudinal displacement on said lift member;

(c) elevating means (61–69) including a pressure fluid cylinder (60) for vertically displacing said lift member through a given vertical stroke (H_2) relative to said fixed beams; and

(d) first drive means (38, 39; 71, 73) for longitudinally displacing said transfer member through a given horizontal stroke (V_2) relative to said lift member; and

(2) lifter means for transferring an extrusion profile from the runout conveyor to said transfer member, said lifter means including

(a) a lifter member (26) connected with said lift member for longitudinal displacement through a given horizontal stroke (V_{26}) between retracted and extended positions relative to said lift member, said lifter member being positioned, when extended, beneath said runout conveyor when said lift member is in its lowered position; and

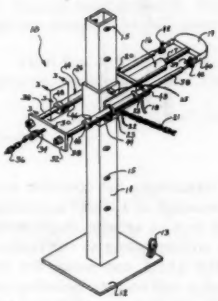
(b) second drive means (31) for displacing said lifter member between its extended and retracted positions relative to said transfer member.

4,507,951

FORCE PRODUCING AND TRANSMITTING APPARATUS

John V. Hultquist, 12861 Western Ave., Unit K, Garden Grove, Calif. 92641

Filed May 9, 1983, Ser. No. 492,895
Int. Cl.³ B21D 1/12
U.S. Cl. 72—431 **17 Claims**



1. Force producing and transmitting apparatus adapted for use in body and frame straightening and shaping, said apparatus comprising:

(a) a base member,

(b) an upright member supported by said base member,

(c) force-producing means,

(d) carriage means adapted to operably connect said force-producing means to said upright member,

(e) attachment means adapted to engage a working element,

(f) resilient, plastic force-transmitting means adapted to transmit pulling force from said force-producing means to said attachment means; and

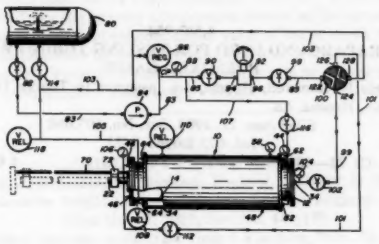
(g) damping means operably connected between said attachment means and said force transmitting means.

4,507,952

APPARATUS FOR TESTING FLOW METERS

Jean-Paul Mathieu, Longueuil, Canada, assignor to ICG Gasbec Inc., Ville Ste-Catherine, Canada

Filed Sep. 14, 1982, Ser. No. 418,058
Int. Cl.³ G01F 25/00
U.S. Cl. 73—3 **2 Claims**



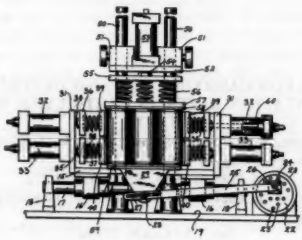
1. An apparatus for proving a flow meter comprising a measuring cylinder and a measuring piston traveling in the cylinder, first port means at one end of the cylinder, second port means at the other end of the cylinder, an indicator rod fixed to the piston and extending axially of the cylinder and through one end thereof, a calibrated scale fixed to said one of end ends of the cylinder and extending parallel and adjacent the path of the indicator rod, a jacket surrounding said cylinder, an inlet port and an outlet port communicating with said jacket, means for alternately communicating a meter to be proved in series with said cylinder ports, means for passing a liquid under pressure for proving the meter, firstly through the jacket for equalizing the temperature of the elements of the prover and then through the meter to be proved and one of the ports in the cylinder on one side of the piston, thus displacing the piston a distance in the cylinder for comparing the indicated calibration on the scale and the reading on the meter, wherein second valve means are provided for selectively circulating the liquid after the pressure has been increased through said jacket, and port means are provided on the jacket communicating with a line returning directly to a reservoir.

4,507,953

ABRASION TESTING MACHINE

Gaston A. Vandermeerssche, 9240 N. Sleepy Hollow La., Milwaukee, Wis. 53217

Filed Aug. 26, 1982, Ser. No. 411,673
Int. Cl.³ G01N 3/56
U.S. Cl. 73—7 **16 Claims**



1. A testing apparatus, comprising:

a horizontal platform adapted to support a test specimen;

horizontal force applying means adapted to engage the sides of the test specimen and simultaneously apply continuous pressure to at least two said sides;

vertical force applying means adapted to engage the top of the test specimen and apply pressure thereto; and

means for vibrating one of said platform and vertical force applying means relative to the other.

4,507,954

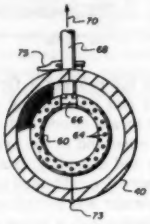
WRAPAROUND USED FOR TESTING TUBING WITH PREMIXED GASES

Johnie R. Boutwell, Houma, La., assignor to Tubing Testors, Inc., Houma, La.

Filed Jun. 27, 1983, Ser. No. 507,688

Int. Cl.³ G01M *3/22*

U.S. Cl. 73—40.7 **6 Claims**



1. A pipe joint testing device for testing the joint integrity of two connected pipe sections, each having a bore pressurized with a test gas which is lighter than air at the joint during testing comprising:

a. an annular envelope having means for affixing the envelope to the annular external joint of two pipe sections being tested;

b. an annular header positioned within the envelope and above the joint being tested during operation and having gas inlet openings which are radially spaced about the joint being tested so that the openings can communicated circumferentially with the envelope above the joint to receive gas leaking from the joint at any radial position of the joint; and

c. suction connection means for drawing gas from the envelope through the openings into the header so that test gas leaking from any radial position of the external annular pipe joint will rise and enter the header.

4,507,955

PIPETTE FOR CARRYING OUT AND DETERMINING SEDIMENTATION RATES, IN PARTICULAR THAT OF BLOOD

Walter Haase, Gelliehäuser Strasse 6, D-3407 Gleichen-Benniehausen, Fed. Rep. of Germany

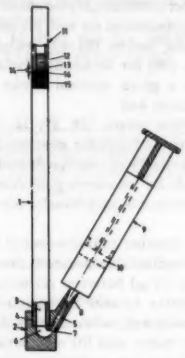
Filed May 4, 1983, Ser. No. 491,272

Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217123

Int. Cl.³ G01N *15/04*

U.S. Cl. 73—61.4 **7 Claims**

1. A pipette for carrying out and determining sedimentation processes, in particular blood sedimentation, including a normally upright transparent tube including at its lower end portion means for receiving a syringe containing the material to be introduced and sedimented, said tube having inside, in the region of its upper end, a filter insert, characterized in that, for filing the tube without a meniscus, said filter is permeable to gas and to the liquid in the material to be sedimented, said filter



insert substantially filling the entire free cross-sectional area of the tube.

4,507,956

CIRCUIT MOUNTING APPARATUS

Lawrence Schlesinger, Durham; Dale F. German, Semora, and Donald L. Richards, Durham, all of N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 9, 1983, Ser. No. 530,558

Int. Cl.³ G01L *19/00*; B60C *23/00*

U.S. Cl. 73—146.5 **9 Claims**

1. Apparatus for mounting a tire condition monitoring element within a tire mounted on a wheel comprising a cylindrical housing formed into an arcuate shape having an inside radius substantially corresponding to the radius of the drop center portion of the wheel, and means for mounting said element to said housing, said housing including resilient means encircling said wheel and applying a sufficient tensile force to said housing to normally maintain it in contact with the surface of said drop center portion while permitting radial and lateral displacement of said housing within said drop center portion when engaged by an object inserted into the drop center portion.

4,507,957

APPARATUS FOR TESTING EARTH FORMATIONS

Marshall N. Montgomery, and John M. Michaels, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed May 16, 1983, Ser. No. 495,313

Int. Cl.³ E21B *49/10*, *47/00*

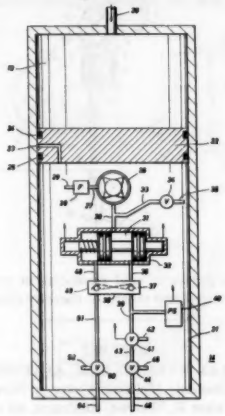
U.S. Cl. 73—151 **16 Claims**

12. Apparatus for collecting samples of the fluid content of earth formations traversed by a borehole, said apparatus in-

cluding an elongated body member adapted to traverse said borehole, comprising:

fluid sample collecting means cooperatively arranged on said body member for receiving a sample of said fluid content;

probe means cooperatively arranged on said body member



for fluidly connecting said body member with said earth formations;

a fluid passage connecting said probe means with said sample collecting means; and

means for controlling the flow pressure level within said fluid passage to at least a predetermined proportional relation to hydrostatic pressure.

4,507,958

SURVEYING OF A BOREHOLE FOR POSITION DETERMINATION

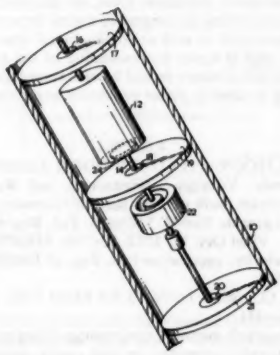
Anthony W. Russell, and Michael K. Russell, both of Cheltenham, England, assignors to NL Sperry-Sun, Inc., Stafford, Tex.

Filed Sep. 8, 1983, Ser. No. 530,184

Claims priority, application United Kingdom, Sep. 11, 1982, 8225968

Int. Cl.³ E21B *47/022*

U.S. Cl. 73—151 **12 Claims**



1. A method of surveying a borehole comprising positioning at the mouth of the borehole a survey instrument having a casing and a three-axis rate gyroscope unit mounted within the casing; sensing at least two components of gravity in at least two mutually transverse directions with respect to the survey instrument by means of a gravity sensor unit; moving the survey instrument along the borehole with the start and finish of the run being at the mouth of the borehole or at some known reference along the path of the borehole; sensing the rates of rotation about three non-coplanar axes at a series of locations along the length of the borehole by means of the rate gyroscope unit; and calculating the position of the borehole at each measuring location by determining an initial set of direction cosines from the gravity components sensed at the mouth of the borehole and an assumed initial value of the azimuth angle, and incrementing these values using the rates of rotation sensed by the rate gyroscope unit to obtain the sets of direction cosines at subsequent measuring locations.

4,507,959

AIRCRAFT INSTRUMENTS

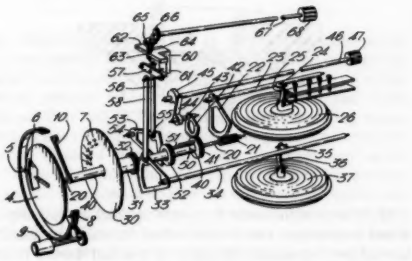
David J. Brazener, Cheltenham, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Nov. 8, 1982, Ser. No. 440,159

Claims priority, application United Kingdom, Nov. 24, 1981, 8135358

Int. Cl.³ G01P *5/16*

U.S. Cl. 73—182 **7 Claims**



1. An instrument having first and second scales, an indicator member mounted for movement along said first and second scales in accordance with a first input variable, said second scale being mounted for displacement with respect to said first scale in accordance with a second input variable, said instrument including: marker means that is settable manually along at least said second scale to represent a reference value against which said indicator member is movable, a first engagement member, means connecting said first engagement member with said marker means such that the disposition of said marker means changes with change in disposition of said first engagement member, a second engagement member, means coupling said second engagement member with said second scale such that said second engagement member is displaced in accordance with said second scale, said second engagement member being arranged to contact said first engagement member and thereby displace said marker means only for values of said second input variable beyond a predetermined value, said second engagement member being free for displacement without contacting said first engagement member for other values of said second input variable, manual adjustment means, and means coupling said manual adjustment means with said second engagement member such that the disposition of said second engagement member relative to said second scale is readily adjustable manually so as thereby to alter the relative disposition of said first and second engagement members and hence the said predetermined value beyond which movement of said second engagement member causes movement of said first engagement member, said manual adjustment means comprising a mechanical linkage, means coupling one end of said mechanical linkage with said second engagement member, means coupling the other end of said mechanical linkage with

said second scale; said mechanical linkage including means for displacing the said one end without displacing the said other end, said mechanical linkage including two links, means coupling one of said links to said second engagement member and the other of said links to the displaceable scale, said two links extending substantially parallel to one another, a transverse arm, means pivotally connecting said arm with said links, a mounting member, means pivotally mounting said transverse arm intermediate its ends with said mounting member, and means mounting said mounting member for manual displacement in a direction substantially parallel to said two links.

4,507,960

SPEED INDICATOR

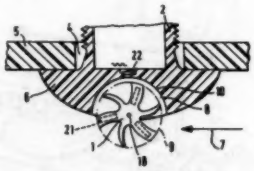
Walter Hufnagel, Glasshütten, and Alois Kreuz, Schmitten, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,470

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1982, 3238433

Int. Cl.³ G01C *21/12*

U.S. Cl. 73—187 **19 Claims**



19. In a speed indicator for water vehicles comprising a vane wheel transducer, and a vane wheel rotatably mounted on a journal and exposed to the extent of one half thereof to flow of the water, the improvement wherein

the vane wheel has vanes, the vanes entering the flow defining flow incoming sides and flow outgoing sides,

the vanes of the vane wheel being formed completely over said flow outgoing sides with the profile of a convex, streamlined airplane wing surface.

4,507,961

LEVEL GAUGE FOR LIQUEFIED GAS TANKS, WITH DIAL-AND-HAND INDICATOR ACTUATED BY AN AXIALLY MOVABLE DRIVE COUPLED WITH A SINGLE INTERNAL MAGNET

Fabio Stradella, 1/8 Via J. Ruffini, 16032 Camogli (Genova), Italy

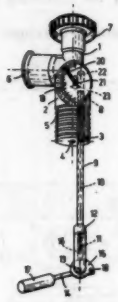
Filed Dec. 7, 1982, Ser. No. 447,514

Claims priority, application Italy, Dec. 7, 1981, 12701 A/81

Int. Cl.³ G01F *23/12*

U.S. Cl. 73—317 **6 Claims**

1. A gauge for monitoring the level of a liquid, which comprises a housing; rod means mounted for vertical movement within said housing and operable to move as the level of the liquid changes; a vertically disposed, elongated magnet fixedly mounted at an upper end of said rod means; a spindle supported by said housing and mounted for rotation about a horizontal axis, said horizontal axis being spaced from said rod means; an indicator means operatively connected to said spindle; and operating means movable between first and second positions for rotating said spindle in response to movement of said rod means, said operating means comprising an elongated nonmagnetic ferrous member, and an arm connecting said spindle to said ferrous member; said magnet being operable to hold said ferrous member by magnetic attraction and thereby move said



operating means between said positions in accordance with said movement of said rod means to thereby rotate said spindle.

4,507,962

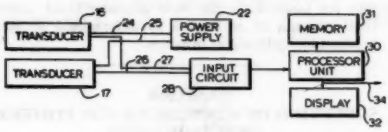
DIGITAL BAROMETRIC ALTIMETER

Gerard J. Hitt, Glendale Heights; Victor A. Nowakowski, Lake Zurich, and Walter R. Warren, Elmhurst, all of Ill., assignors to AAR Corp., Elk Grove Village, Ill.

Filed Sep. 8, 1981, Ser. No. 300,230

Int. Cl.³ G01L *7/00*

U.S. Cl. 73—384 **14 Claims**



1. A digital altimeter comprising a pressure transducer for developing an electrical signal in response to air pressure, said transducer being supported on an exterior air frame wall and connected to a pitot tube mounted in a housing supported on the exterior side of said air frame wall, filter means connected to said transducer for filtering noise from the electrical signal developed by said transducer, said filter means comprising a recursive adaptive stochastic filter, an analog-to-digital converter for converting said signal to digital form, and a processor unit connected to said analog-to-digital converter for developing a digital signal representative of the altitude corresponding to the pressure sensed by said transducer, said transducer being located in direct proximity to a pitostatic port.

4,507,963

TACHOGRAPH COVER DOOR ASSEMBLY

Bernd Donner, Villingen-Schwenningen, and Roland Siefert, Bad Dürrheim, both of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Oct. 21, 1982, Ser. No. 435,557

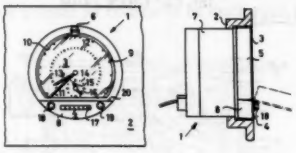
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142677

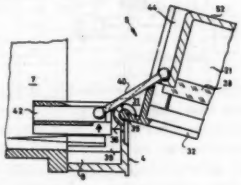
Int. Cl.³ G01D *11/24, 15/00*; E05D *7/00, 11/10*

U.S. Cl. 73—431 **4 Claims**

1. A tachograph assembly comprising: casing means; a cover member pivotally supported on said casing means for movement between an open and a closed position, said cover member comprising a first part adapted to engage said casing means to effect centering of said cover member relative to said casing means and a second part which is connected to said first part; operative recording means physically located in both said

casing means and said cover member arranged to be placed in cooperative connection when said cover member is in the closed position; a casing extension connected with said casing means; first pivotal bearing means formed on said first part of said cover member; second pivotal bearing means formed on said casing extension; said second pivotal bearing means having an outer radius corresponding to the inner radius of said





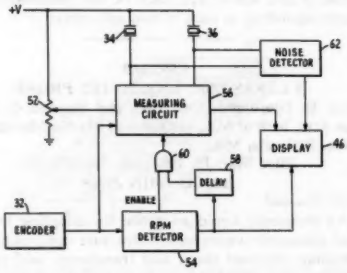
first pivotal bearing means; and bearing spindle means formed on said second part of said cover member cooperatively engaging said second pivotal bearing means for enabling pivotal motion of said cover member relative to said casing means; said first and said second pivotal bearing means being adapted to be placed in cooperative relationship with each other prior to placement of said second part of said cover member in said assembly.

4,507,964

SLOW SPEED DYNAMIC WHEEL BALANCER

Willy Borner, 21096 Grenola Dr., Cupertino, Calif. 95014, and Bernie F. Jackson, 23485 Summit Rd., Los Gatos, Calif. 95030

Filed Nov. 29, 1982, Ser. No. 444,885
Int. Cl.³ G01M *1/22*
U.S. Cl. 73—462 **37 Claims**



1. A method for dynamically determining the imbalance of a combined wheel and tire for a motor vehicle, comprising the steps of:

mounting the wheel on a rotatable shaft;

manually effecting rotation to the wheel and the shaft to inpart a velocity no greater than 180 rpm;

allowing wheel and shaft to coast and slow down;

measuring forces transmitted by the shaft while said shaft and wheel are coasting at a measuring velocity no greater than 180 rpm;

determining imbalance data related to the measured forces; and

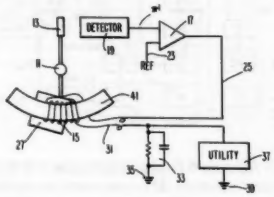
displaying the imbalance data.

4,507,965

DETECTOR FOR DETERMINING BOTH FORCES ON AND POSITIONS OF A HOST DEVICE

Leo M. Stratton, West Chester; Kenneth J. Sipple, Chester Heights, both of Pa., and Mario B. Tatonetti, Voorhees, N.J., assignors to Columbia Research Laboratories, Woodlyn, Pa.

Filed Sep. 24, 1982, Ser. No. 422,749
Int. Cl.³ G01P *15/13*; G01C *9/12*
U.S. Cl. 73—517 B **4 Claims**



1. A detector means for use in determining information about forces applied to, and alternatively positions of, a device with which said detector means is used comprising in combination: mass member means having length, width and depth dimensions; first and second magnetic flux generating means disposed to have a gap therebetween; magnetic flux conducting means disposed within said gap; electrical coil means formed to be movable within said gap and formed to surround said magnetic flux conducting means when moved within said gap; shaft means having first and second protrusions and formed to hold said electrical coil so that its longitudinal axis is substantially perpendicular to said first and second protrusions and formed to hold said mass member means so that its depth dimension is substantially perpendicular to said protrusions, said shaft means further formed to hold said electrical coil means and said mass member means at opposite ends of said shaft means and for rotational movement around said protrusions; first and second ball bearing assemblies formed to fit respectively over said first and second protrusions and formed so that while each of said protrusions is held in substantial lateral and vertical restraint, each of said protrusions is free for rotational movement within minimal frictional restraint, said first and second ball bearing assemblies disposed to hold said shaft means at said protrusions so that said electrical coil means will be rotationally moved through at least a part of said magnetic flux in response to any positioning of said mass member means; and detection means formed and disposed to respond to every position of said mass member means to provide electrical current to said electrical coil to effect positioning said mass member means and to detect said electrical current as a measure of force applied to, and alternatively positions of, a device with which said detector means is used.

4,507,966

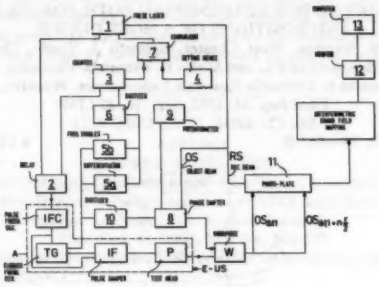
METHOD AND MEANS FOR IMAGING SOUND WAVES

Horst-Artur Crostack, Beringweg 2, D 5860 Iserlohn, Fed. Rep. of Germany

Filed Oct. 3, 1982, Ser. No. 438,958
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143811; Nov. 4, 1981, 8132276[U]
Int. Cl.³ G03H *3/00*
U.S. Cl. 73—603 **22 Claims**

1. A method for imaging sound fields using optical holographic interferometery, comprising; applying sound pulses to an object to be imaged to form sound fields, illuminating the

sound fields with laser pulses of periods shorter than the periods of the sound pulses to form object beams, forming reference beams for interference with the object beams, holographically superimposing two object beams which originate at different moments in time from the object to be mapped into an interferogram, the step of illuminating occurring for two



pulses of the sound field to be imaged at a minimum value and a maximum value, at different moments in time, and changing the relative phase of the laser pulse and the reference beam which interferes with the illumination between the individual illuminations by a preselectable amount which deviates from π and which suppresses the optical or acoustical noise in the resulting interferogram.

4,507,967

METHOD AND APPARATUS FOR THE NON-DESTRUCTIVE TESTING OF MATERIALS BY THE USE OF ULTRA-SONIC WAVES

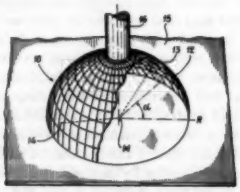
Robert J. Schliekelmann, Amstelveen, Netherlands, assignor to Fokker BV, Schiphol-Oost, Netherlands

Filed Feb. 16, 1983, Ser. No. 467,136

Claims priority, application Netherlands, Feb. 16, 1982, 8200589

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—621 **5 Claims**



1. A method for the non-destructive, qualitative testing of the properties of materials by the use of ultrasonic waves, comprising the steps of:

a. transmitting ultrasonic waves towards the material to be tested at varying angles of incidence and from different directions by means of a plurality of transmitters;

b. receiving the transmitted waves reflected by the material by means of a plurality of receivers; and

c. varying the angle and direction of incidence of the ultrasonic waves by activating the transmitters and receivers in a predetermined way;

said transmitters and receivers being positioned in a semi-spherical arrangement relative to the material, the center of said semi-spherical arrangement coinciding with the point of incidence of the ultrasonic waves on the material to be tested.

4,507,968

ULTRASOUND VISUALIZATION SYSTEMS

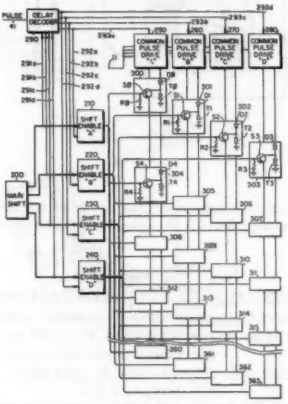
Michael K. Roberts, Arvada; Richard A. Ottosen, Denver, and Matthew L. McConnell, Boulder, all of Colo., assignors to Bion Corporation, Westminster, Colo.

Division of Ser. No. 204,589, Nov. 6, 1980, Pat. No. 4,381,675.

This application Apr. 4, 1983, Ser. No. 481,816

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—626 **6 Claims**



1. Ultrasonic visualization head circuitry comprising:

(a) a linear array of transducers, said array including n sub-arrays periodically arranged within said array such that for every transducer in each sub-array, the next transducer in that sub-array is the n^{th} next transducer in said array;

(b) n shift enable means for enabling a transducer in one of said sub-arrays, and for sequentially shifting the enabled transducer to the next transducer in said sub-array, each of said n shift enable means corresponding to each of said n sub-arrays;

(c) mean shift means for sequentially activating shifts by said n shift enable means; said main shift means activating each of said shift enable means in a periodic fashion such that at any time the n transducers enabled by said shift enable means are adjacent; and

(d) n pulse driver means for exciting enabled transducers in one of said sub-arrays; each of said pulse driver means corresponding to each of said sub-arrays.

4,507,969

ULTRASONIC LIQUID JET PROBE

Borislav B. Djordjevic, Columbia, and Stephen C. Traugott, Glen Arm, both of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Mar. 15, 1983, Ser. No. 475,583

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—644 **8 Claims**

1. An ultrasonic liquid jet probe for coupling transducer-emitted ultrasonic waves with a structure comprising:

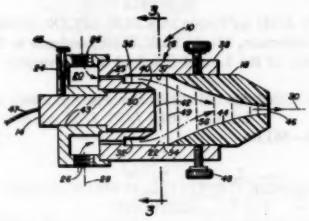
a housing disposed about said transducer, said transducer having an emitting/receiving end, and said housing comprising:

(a) inlet means comprising at least two inlet ducts spaced symmetrically about said housing for receiving liquid under pressure from a source thereof;

(b) first and second chambers defined in the interior of said housing and in fluid communication with each other through a plurality of circumferentially spaced conduits, said first chamber being arranged to receive said liquid from said inlet ducts, said conduits being disposed up-

stream of said emitting/receiving end of said transducer and being aligned parallel to said liquid jet column and elongated sufficiently and of sufficient number for imparting a substantially laminar flow to said liquid flowing from said first to said second chambers; and,

(c) a nozzle configured for receiving said liquid flowing through said second chamber, shaping the flow of said liquid into a liquid jet column to be discharged from said



nozzle and guiding said ultrasonic waves between said transducer and said liquid jet column, said nozzle being disposed sufficiently close to said emitting/receiving end of said transducer for providing an obstruction-free ultrasonic path between said emitting/receiving end of said transducer and said nozzle and enabling said ultrasonic waves emitted by said transducer to be guided to said liquid jet column by only said nozzle.

4,507,970

PRESSURE SENSITIVE ELEMENT AND A SENSOR COMPRISING SUCH AN ELEMENT

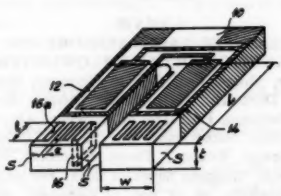
Rudolf Dinger, St-Aubin, Switzerland, assignor to Asulab S.A., Bienne, Switzerland

Filed Jul. 13, 1983, Ser. No. 513,520

Claims priority, application France, Jul. 13, 1982, 82 12532

Int. Cl.³ G01L *7/00*; H01L *41/10*

U.S. Cl. 73—702 **3 Claims**



1. A sensitive element for use in a pressure sensor, comprising a tuning-fork of piezoelectric material having a pair of arms, each arm having a pair of parallel flanks, said tuning fork being provided with electrodes to vibrate said arms in the flexion mode in a direction substantially at right angles to said flanks, wherein the free end portion of each arm is provided with at least one elongated slot extending parallel to said flank such that the lateral surfaces thereof will also be substantially at right angles to the direction of motion of said arms, said slot extending right through the thickness of the arms.

4,507,971

HYDRAULIC FILTER FOR ELIMINATING SLOW PRESSURE FLUCTUATIONS

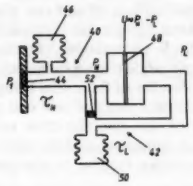
Josef Vachek, Überlingen-Hödingen, Fed. Rep. of Germany, assignor to Bodenseewerk Geratetechnik GmbH, Bodensee, Fed. Rep. of Germany

Continuation of Ser. No. 287,937, Jul. 29, 1981, abandoned. This application Mar. 26, 1984, Ser. No. 593,425

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1980, 3028657

Int. Cl.³ G01L *7/08, 9/00*

U.S. Cl. 73—707 **4 Claims**



1. An apparatus for measuring a range of pressure fluctuations in a liquid subjected to pressure fluctuations within said range and outside of said range comprising,

a differential pressure transmitter,

a first low-pass hydraulic filter including a first hydraulic accumulator and a first restrictor, said accumulator communicating with one side of said transmitter and through said first restrictor to the liquid subjected to pressure fluctuations, said first filter blocking the passage of pressure fluctuations to said transmitter above a predetermined frequency,

a second low-pass hydraulic filter including a second hydraulic accumulator and a second restrictor, said accumulator communicating directly with the other side of said transmitter, and with said one side of said transmitter and said first accumulator through said second restrictor, and second filter blocking the passage of pressure fluctuations to said transmitter below a predetermined frequency lower than that of said first filter,

wherein said transmitter measures the range of pressure fluctuations between the frequencies of said filters and suppresses fluctuations above and below said range.

4,507,972

PRESSURE GAUGE

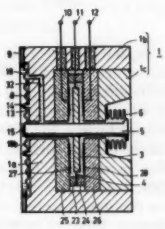
Saichiro Morita, Tokyo, Japan, assignor to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,699

Claims priority, application Japan, Aug. 5, 1980, 55-106725

Int. Cl.³ G01L *19/04, 9/12*

U.S. Cl. 73—708 **9 Claims**



1. A pressure gauge comprising:

a tubular body;

a pressure receiving element attached to one end of said

body for isolating the interior thereof from the outside and for receiving an external pressure;

an end plate covering the other end of said tubular body, said end plate having a through hole formed centrally therein, and said end plate also having an outwardly protruding flat-topped circular ridge formed on the outer surface thereof concentrically with said through hole;

a temperature compensating diaphragm for isolating the interior of said tubular body from the outside, said diaphragm having a marginal portion which is welded to the other end of said body such that the region of said diaphragm radially inward of said marginal portion is spaced from the outer surface of said end plate, said diaphragm having a central flat portion surrounded by a plurality of concentric circle corrugations, the crests of a plurality of said concentric circle corrugations being formed flat, only one of said plurality of flat crests being welded to the flat top of said circular ridge of said end plate thereby to fix the position of said one flat crest relative to the outer surface of said end plates, and the others of said flat crests being free to move relative to said outer surface of said end plate;

a coupling shaft disposed in said body and extending through said through hole, one end of said shaft being coupled to said pressure receiving element and the other end of said shaft being affixed to said central flat portion of said diaphragm;

detecting means coupled to said shaft for providing a signal in response to the displacement of or a force received by said coupling shaft; and

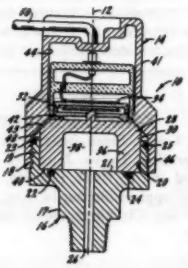
a liquid sealed in said tubular body.

4,507,973

HOUSING FOR CAPACITIVE PRESSURE SENSOR

Rodney E. Barr, Cary, N.C., and George E. Kochanek, Glen Ellyn, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 31, 1983, Ser. No. 528,281
Int. Cl.³ G01L 9/12
U.S. Cl. 73—724 **7 Claims**



1. A housing for a capacitive sensor used in the measurement of pressure in a fluid, which capacitive sensor includes:

a flexible ceramic diaphragm including a reference surface, a bottom surface, sidewalls, and a chamfered shoulder between said reference surface and sidewalls, and a pressure chamber open at the bottom surface, the reference surface being deflectable in response to a force acting in said pressure chamber;

a capacitive sensor positioned so that its capacitance is varied as the diaphragm reference surface is deflected;

wherein said housing comprises a lower member and an upper member connected to each other and enclosing the sensor;

said housing lower member defining a recess for receiving the diaphragm sidewalls, and further defining a channel communicating with the diaphragm pressure chamber; and

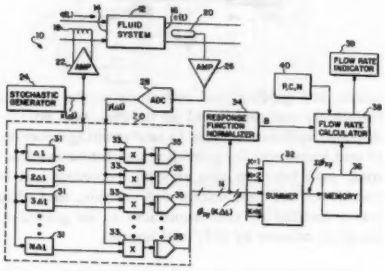
said housing upper member defines first and second portions of different diameters, and a shoulder between the first and second portions of different diameters, which shoulder abuts the chamfered shoulder of said flexible diaphragm.

4,507,974

METHOD AND APPARATUS FOR MEASURING FLOW

Mark L. Yelderman, Menlo Park, Calif., assignor to The Board of Trustees of the Leland Stanford Jr. University, Stanford, Calif.

Filed Apr. 21, 1983, Ser. No. 487,334
Int. Cl.³ G01F 1/70, 1/68
U.S. Cl. 73—861.06 **20 Claims**



1. A method for measuring flow of a fluid between a system entry point and a system exit point comprising:

applying an indicator in the form of a known simulated or actual stochastic excitation signal to said fluid at said system entry point;

sensing time-dependent response of said fluid to said excitation signal at said system exit point to obtain a response signal;

cross-correlating said excitation signal with said response signal to construct a cross-correlation function signal;

extracting a signal representative of said flow rate from said cross-correlation function signal and a knowledge of indicator quantity of said excitation signal; and

presenting said flow representative signal to a signal utilization means.

4,507,975

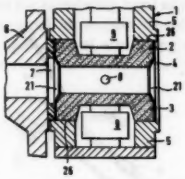
MEASURED-VALUE SENSORS FOR MAGNETIC-INDUCTIVE FLOWMETERS

Franz Bittner, Moers, Fed. Rep. of Germany; Boudewijn J. Poortman, Dordrecht, Netherlands; Kristian Rademacher-Dubbick, Duisburg, Fed. Rep. of Germany; Abram K. Roskam, Sleeuwijk, Netherlands; Udo Stevens, Duisburg, Fed. Rep. of Germany, Wouter T. Tromp, Sliedrecht, Netherlands; Walter Beisler, Benshein; Seigfried Bock; Hermann Bertsch, both of Mannheim, all of Fed. of Germany, assignors to Rheometron AG, Basel, Switzerland

Continuation-in-part of Ser. No. 432,955, Sep. 28, 1982, abandoned. This application Dec. 29, 1982, Ser. No. 454,156
Claims priority, application European Pat. Off., Nov. 27, 1981, 81201316.7
Int. Cl.³ G01F 1/58
U.S. Cl. 73—861.12 **16 Claims**

1. In a measured-value sensor for a magnetic-inductive flowmeter, comprising an electrically insulating ceramic measuring tube which is arranged inside a steel housing and provided on two opposite sides with measuring electrodes which pass radially through the wall of the measuring tube and with magnet

coils arranged on the wall, the improvement wherein said measuring tube is composed of a tight burnt ceramic material



into which shafts of the measuring electrodes are sintered in a leakproof manner.

4,507,976

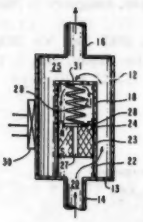
FLOW METER WITH HALL EFFECT SENSOR AND METHOD

William Banko, Bronx, N.Y., assignor to Morris Shamos, Bronx and Henry E. Allen, Mamaroneck, both of, N.Y.

Filed Jul. 14, 1982, Ser. No. 398,215

Int. Cl.³ G01F *1/24*

U.S. Cl. 73—861.54 **6 Claims**



1. A fluid flow meter comprising:

a fluid tight housing, including an inlet and an outlet;

a hollow liner mounted within said housing including at least one slot, said slot for receiving fluid from said inlet and communicating said fluid to said outlet;

a magnetic piston slidably positioned within said liner for movement in response to the flow of fluid from said inlet through said slot independent of gravity and spatial orientation; and

transducer means mounted on said housing in substantially side-by-side relation to said piston for producing an electrical signal corresponding to the position of said piston in said liner.

4,507,977

LIQUID METERING AND TRANSFER VALVE ASSEMBLY

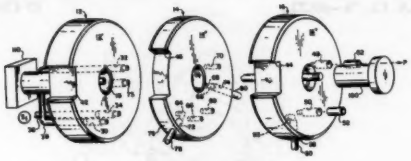
Pedro P. Cabrera, Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 312,218, Oct. 19, 1981, Pat. No. 4,445,391. This application Jun. 9, 1983, Ser. No. 502,672

Int. Cl.³ B01L *3/02*

U.S. Cl. 73—864.12 **10 Claims**

1. A liquid metering and transfer valve assembly for use in providing at least a pair of segmented precise samples from a single liquid sample source, the volume of one segmented sample being different than the volume of the other segmented sample of said pair, said valve assembly being operable between a load and a delivery condition and comprising a pair of spaced outer valve elements and a movable inner valve element sandwiched between said outer valve elements, said inner valve element having opposite faces sealingly frictionally engaged with adjacent faces of said outer valve elements, said inner and outer valve elements having first and second segmenting passageway means formed therein for receiving liquid sample therein from a source thereof, the contents of said first and second segmenting passageway means being isolatable one from the other and each respectively combined with a predetermined volume of diluent and delivered with said volume respectively to different preselected exterior locations, at least one of said outer valve elements being stationary, an aspirator probe coupled to the other of said outer valve elements, move-



ment of said inner valve element effecting the segmenting of the liquid sample, the other of said outer valve elements is movable independently relative to the inner valve element and a second aspirator probe is coupled to said other of said outer valve elements spaced angularly from said first aspirator probe, said other of said outer valve elements being selectively movable for placement of one of said first and second aspirator probes in communication with said first and second segmenting passageway means.

4,507,978

STARTER

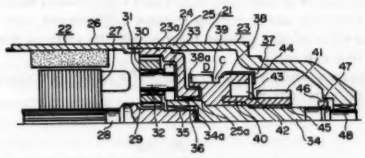
Toshinori Tanaka, and Akira Morishita, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1982, Ser. No. 435,189

Claims priority, application Japan, Oct. 30, 1981, 56-163437[U]

Int. Cl.³ F02N *11/00*; F16H *1/28, 3/44*

U.S. Cl. 74—7 E **6 Claims**



1. A starter having a motor (21) and a planetary gear deceleration means (30), comprising:

a rotary shaft (28) rotated by said motor;

an output rotary member (34);

first bearing means (35) for supporting said rotary shaft;

second bearing means (36) for supporting said output rotary member, said second bearing means being disposed so as to overlap said first bearing means along a radial direction of said rotary shaft;

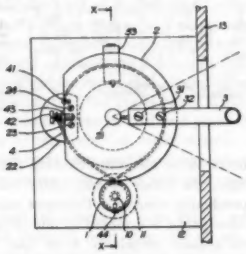
an overrunning clutch (37) having an engaging portion (C); and

a shift lever (39) located in said engaging portion, said shift lever and said engaging portion being disposed in a space at an outer periphery of said first and second bearing means so as to at least partially overlap said first and second bearing means along said radial direction of said rotary shaft.

4,507,979
ARRANGEMENT FOR ROTATING THE SHAFT OF AN ELECTRICAL COMPONENT

Tadeusz Zebrowski, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1982, Ser. No. 350,489
Claims priority, application United Kingdom, Mar. 25, 1981, 8109380; Nov. 20, 1981, 8134985
Int. Cl.[3] F16H *27/02, 21/44;* G05G *1/08*
U.S. Cl. 74—89.22 15 Claims



1. An arrangement for frictionally coupling a driving shaft to a parallel driven shaft, comprising

a frame,

first and second shafts,

means for mounting said shafts in a laterally fixed relationship with respect to said frame for rotation about parallel axes spaced a given distance apart,

first and second pulleys respectively mounted to said first and second shafts, said first pulley having a rim having a first rim radius and a circumferential groove having a first groove radius, said second pulley having a rim having a second rim radius and a circumferential groove having a second groove radius, and

a tensioned cord arranged around said grooves in a figure of eight formation wherein said cord is a single cord which is passed fully around at least one of said pulleys and is fixedly secured to the other pulley,

characterized in that the sum of the radii of said rims equals said given distance,

the tension of said cord biases said rims toward each other so that they are in rolling friction engagement, and

the ratio of said groove radii equals the ratio of the respective rim radii,

whereby said thrusts on said shafts resulting from the coupling is reduced.

4,507,980
LOW VIBRATION-LEVEL REMOTE CONTROL GEARSHIFT LINKAGE FOR MANUAL TRANSMISSION

Taichiro Nishiyama, Musashimurayama, and Shinsaku Tsuji, Atsugi, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 30, 1982, Ser. No. 454,614
Claims priority, application Japan, Mar. 1, 1982, 57-30499
Int. Cl.[3] G05G *9/16;* F16M *13/00*
U.S. Cl. 74—473 R 4 Claims

1. A remote control gear shift linkage system for a manual type vehicular transmission, comprising:

a manually operable control lever having upper and lower ends,

a support member for supporting said control lever at an intermediate portion thereof between said upper and lower ends so that said control lever is swingable at said intermediate portion,

means for resiliently mounting said support member to a vehicle body,

a control rod connected between said lower end of said control lever and the transmission, for transmitting movement of said control lever to the transmission to effect a gear change of the transmission, a support rod

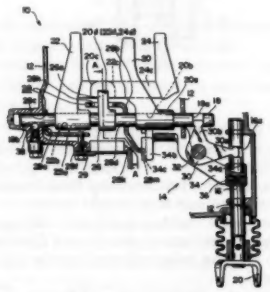
connected between said support member and a case of the transmission, and

mass means fastened to a portion of said support rod for altering the resonant frequency of said support rod.

4,507,981
TRANSMISSION SHIFT CONTROL MECHANISM

Kazuyoshi Hiraiwa, Atsugi, and Saburou Yamasaki, Sagamihara, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 28, 1982, Ser. No. 383,257
Claims priority, application Japan, Jun. 1, 1981, 56-82546
Int. Cl.[3] G05G *5/10, 9/16*
U.S. Cl. 74—477 9 Claims



1. A transmission shift control mechanism comprising a housing, a control input shaft rotatable and slidable in a wall of said housing, a fork shaft substantially normal to said control input shaft and rotatable and slidable in the wall of said housing, a plurality of shift forks movable between predetermined neutral and shifting positions and having slots arranged side-by-side in a predetermined array when said shift forks are in the neutral positions thereof, a selector lever secured to said fork shaft to move together therewith and having a selector finger movable in said slots in response to rotary movement of said fork shaft in response to rotary movement of said fork shaft so as to selectively engage in one of said slots, said selector lever being operable to shift a selected one of said shift forks into the corresponding shifting position through movement along the axis of said fork shaft together with same, an interlock member for preventing simultaneous shifting of two of said shift forks, said interlock member being mounted on said fork shaft and drivingly connected to said selector lever for rotation with said selector lever but held axially stationary of said fork shaft relative to said housing while allowing axial movement of said selector lever relative to said interlock member, a control arm having a hub portion at one end thereof mounted on said control input shaft for rotation therewith and

an opposite end directly attached to an arm of said interlock member for translating rotary movement of said control input shaft into rotary movement of said selector lever and said fork shaft, and means for translating axial movement of said control input shaft into axial movement of said fork shaft and said selector lever, said control arm being operable to rotate the selector shaft in response to rotation of the control input shaft.

4,507,982

STEERING COLUMN ASSEMBLY

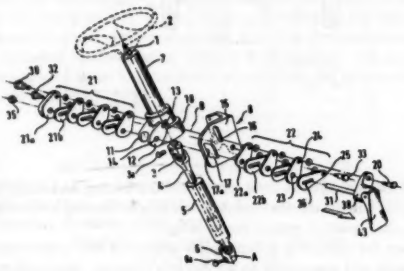
Robert Turner, Rayleigh, and Robert A. Seabrook, Billericay, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 11, 1982, Ser. No. 348,115

Claims priority, application United Kingdom, Feb. 13, 1981, 8104541

Int. Cl.³ B62D *1/18*; G05G *5/16*

U.S. Cl. 74—493 **7 Claims**



1. A steering column assembly comprising a column part, a support rotatably carrying the column part, a bracket carrying the support and adapted to be secured to a fixed member, means securing the support to the bracket to permit relative movement thereof and a lock for fixing the bracket and the support in a desired relative configuration, characterized in that the means securing the support to the bracket comprises a sliding connection which permits relative movement thereof along an axis and about a pivot axis perpendicular thereto, and a guide defining the limits of the range of relative movement of the bracket and the support, wherein the lock comprises (i) a plurality of friction surfaces movable over each other when the support is moved relative to the bracket, (ii) a locking element movable into and out of a locking position to vary the frictional force between the friction surfaces, comprising a link movable relative to a mounting fixed to the bracket and an operating lever pivotably mounted on the mounting and contacting the link, and (iii) means for biasing the locking element into the locking position comprising a spring acting between the link and the mounting, and wherein one friction surface is provided by a first friction plate fixed relative to either one of the support or the bracket, and another friction surface is provided by a second friction plate pivotably connected to the first friction plate and to the other of the support or the bracket, the pivotable connection of the second friction plate allowing relative radial sliding movement of the friction plates.

4,507,983

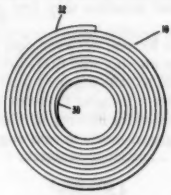
ENERGY STORAGE FLYWHEEL USING LIQUID CRYSTALLINE POLYMER TAPE

Gabor D. Kiss, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,165

Int. Cl.³ F16F *15/30*; B32B *31/30*

U.S. Cl. 74—572 **19 Claims**



1. A flywheel comprising a diametrically wound unitary tape of a thermotropic liquid crystalline polymer.

4,507,984

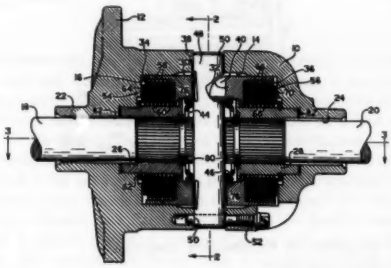
SINGLE SHAFT POSITIVE DRIVE

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 8, 1982, Ser. No. 355,971

Int. Cl.³ F16H *35/04*

U.S. Cl. 74—650 **22 Claims**



1. A positive drive comprising:

(a) an input member adapted to be rotated by driving torque transmitted from a power source to rotate a pair of spaced output members defining an axis of rotation;

(b) a single-piece housing operatively associated with said input member and surrounding both of said output members;

(c) first clutch means having an engaged mode which locks in a predetermined rotational relationship said input member to one of said output members when said one output member is rotating at an angular velocity in the direction of torque transmittal that is equal to or less than a predetermined angular velocity of said other output member and having a disengaged mode which allows said one output member to rotate relative to said input member when said one output member is rotating at an angular velocity in the direction of torque transmittal that is greater than said predetermined angular velocity of said other output member;

(d) second clutch means spaced from said first clutch means and having an engaged mode which locks in a predetermined rotational relationship said input member to said output member when said other output member is rotating at an angular velocity in the direction of torque transmittal that is equal to or less than a predetermined angular veloc-

ity of said one output member and having a disengaged mode which allows said other output member to rotate relative to said input member when said other output member is rotating at an angular velocity in the direction of torque transmittal that is greater than said predetermined angular velocity of said one output member;

(e) a shaft extending through said single-piece housing, oriented approximately perpendicular to said axis of rotation, and located between said first and second clutch means;

(f) first cam means located between said shaft and said first clutch means for moving said first clutch means from said disengaged mode to said engaged mode; and

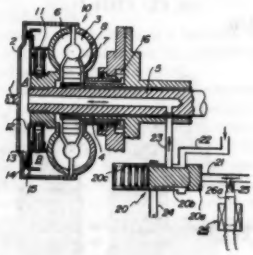
(g) second cam means located between said shaft and said second clutch means for moving said second clutch means from said disengaged mode to said engaged mode.

4,507,985

APPARATUS FOR CONTROLLING A DIRECT DRIVE CLUTCH FOR A VEHICLE AUTOMATIC TRANSMISSION

Yoshiro Morimoto, Yokohama, and Norimasa Kishi, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 31, 1980, Ser. No. 173,884
Claims priority, application Japan, Aug. 4, 1979, 54-99123
Int. Cl.³ B60K *41/06*; F16H *47/00*
U.S. Cl. 74—866 **5 Claims**



1. An automatic transmission comprising:

a torque converter;

a direct drive clutch adapted to directly connect input and output members of the torque converter;

at least one planetary gear unit connected with the output member of the torque converter;

a plurality of frictional elements which effect a changeover of a power transmission path in the planetary gear unit to provide a plurality of shift positions;

hydraulic circuit means having a pressurized oil source, a pressure regulator valve regulating oil pressure supplied from the oil source, a plurality of shift valves selectively supplying the regulated oil pressure to the frictional elements based on a predetermined first relation between vehicle speed and engine torque, and a direct drive clutch control valve selectively supplying the regulated oil pressure to the direct drive clutch,

said direct drive clutch control valve including a valve body controlling a supply of the oil pressure to the direct drive clutch, a hydraulic chamber applying the oil pressure onto the valve body and an oil conduit supplying said regulated oil pressure to the hydraulic chamber through at least one of said shift valves and at least one of said frictional elements, said conduit having a first orifice between said one of the shift valves and said one of the frictional elements, a second orifice between said one of the frictional elements and said hydraulic chamber, and a third drain orifice between said second orifice and said hydraulic chamber, and further comprising an electromagnetic valve which opens or closes said third drain orifice in response to said signal actuating said direct drive clutch control valve; and

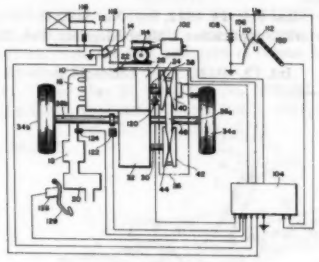
a direct drive clutch operation discriminating circuit which receives a signal corresponding to the vehicle speed and a signal corresponding to the engine torque and produces a signal actuating said drive drive clutch control valve based on a predetermined second relation between the vehicle speed and the engine torque.

4,507,986

CONTROL SYSTEM FOR MOTOR VEHICLE

Kenji Okamura, Yokosuka; Hatsuo Nagaishi, Zushi; Tsuyoshi Kitahara, Yokohama; Kohki Sone, Tokyo, and Koyo Nakamura, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 22, 1982, Ser. No. 351,266
Claims priority, application Japan, Feb. 24, 1981, 56-24968
Int. Cl.³ B60K *41/18, 41/12*
U.S. Cl. 74—866 **11 Claims**



1. A control system for a motor vehicle having an accelerator pedal and an internal combustion engine having a throttle valve, said control system comprising:

means for detecting a depression degree of the accelerator pedal and generating an accelerator position signal indicative of the detected depression degree of the accelerator pedal;

means for detecting a vehicle speed of the motor vehicle and generating a vehicle speed signal indicative of the detected vehicle speed;

means for detecting an engine speed of the engine and generating an actual engine speed signal indicative of the detected engine speed;

means for adjusting an open position of the throttle valve in response to at least the detected depression degree of the accelerator pedal when the depression degree of the accelerator pedal is smaller than a predetermined depression degree, but keeping the throttle valve in a fully open position thereof irrespective of the depression degree of the accelerator pedal when the depression degree of the accelerator pedal is larger than a predetermined depression degree;

means responsive to said accelerator depression degree signal and said vehicle speed signal for determining a target engine speed predetermined for the detected position of the accelerator pedal and the detected vehicle speed and generating a target engine speed signal indicative of the determined target engine speed;

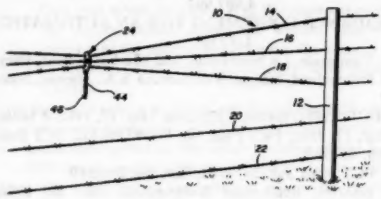
a continuously variable transmission operatively connected to the engine to be driven thereby; and

means responsive to said target engine speed signal and said actual engine speed signal for adjusting a drive ratio of said continuously variable transmission.

4,507,987
WIRE FENCE STRAND SPREADER

Otto E. vonBergen, 1204 5th St., Columbus, Nebr. 68601

Filed May 31, 1983, Ser. No. 501,064
Int. Cl.³ B25B 25/00
U.S. Cl. 81—485 7 Claims

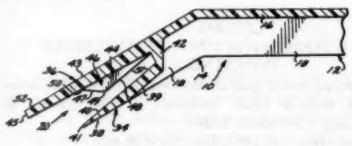


1. A wire fence strand spreader including an elongated body defining opposite end hooks opening longitudinally of said body toward each other in directions inclined slightly outwardly of one side of said body, a longitudinal mid-portion of said body spaced between said hooks including an opening formed transversely therethrough and in which a user's first finger may be received to provide an anti-slip anchoring of said finger to said body, the side of said body opposite said one side including oppositely inclined opposite end abutment surfaces extending longitudinally therealong each, selectively, engageable by the thumb of a hand having the first finger thereof engaged through said opening, said abutment surfaces defining an included angle opening toward said opening, said hooks being spaced apart longitudinally of said body on remote sides of said opening.

4,507,988
BEVERAGE RECEPTACLE OPENER

Joseph S. LoFaso; Mardi I. LoFaso, both of 4232 Miguel View Dr., La Mesa, Calif. 92041, and Kenneth R. Gold, 6450 Via Arboles, Anaheim, Calif. 92087

Filed Nov. 18, 1982, Ser. No. 442,729
Int. Cl.³ B67B 7/00
U.S. Cl. 81—3.09 5 Claims



1. An opener for actuating the tab of a beverage can of the type having a pull-up tab that opens a scored closure segment of the can lid and has a recessed central section, said opener comprising:

an elongated rearward body;

elongated forward tab actuating structure extending generally longitudinally from said body, said tab actuating structure comprising spaced-apart, generally longitudinally arranged lower and upper jaws, said upper jaw having a generally downwardly-facing lower surface and said lower jaw having an opposed, generally upwardly-facing upper surface, said opposed surfaces defining between them a forwardly opening slot which is substantially open-sided; and

an elongated, longitudinally arranged, substantially transversely centered rib on said upper jaw extending downwardly from said lower surface of the upper jaw toward said upper surface of the lower jaw, said rib and said upper surface of the lower jaw defining a tab-gripping notch therebetween;

said rib being engageable within said recessed central section of said tab so as to interlock said tab-actuating structure and said tab in the transverse direction;

said rib having a forward edge extending rearwardly and downwardly from said lower surface of the upper jaw so as to define a lead-in ramp for guiding said pull-up tab into said tab-gripping notch;

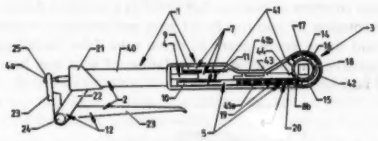
said rib having a rearward edge defining the upper surface of said tab-gripping notch; and

said rib having a generally triangular side profile, said forward and rearward edges of said rib meeting at an apex that is engageable within said recessed central section of said tab.

4,507,989
RATCHET TOOL

Rodney W. Baker, 60 Oranga St., New Plymouth, New Zealand

Filed Nov. 3, 1982, Ser. No. 438,966
Claims priority, application New Zealand, Nov. 3, 1981, 198861; Jan. 29, 1982, 199602
Int. Cl.³ B25B 13/46
U.S. Cl. 81—57.39 6 Claims

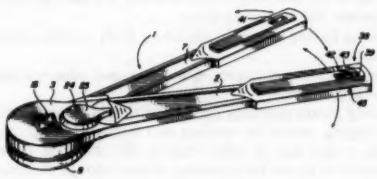


1. A ratchet tool comprising a tubular body having a handle at one end and a ratchet drive at the other end, a plunger disposed within the body, a drive mechanism connecting the plunger with the ratchet drive, return bias means arranged to apply a return bias to the plunger of the drive mechanism, said drive mechanism comprising a flexible member having one end connected to the ratchet drive and the other end connected to a gear mechanism which includes a fixed rack mounted within the body, a slidable rack fixed as aforesaid to the flexible member and a pinion mounted for rotation on one end of the plunger, the arrangement being such upon reciprocation of said plunger the linear motion of the plunger is translated into rotational motion of said ratchet drive.

4,507,990
RATCHET WRENCH

Larry H. Lack, Bossier City, La., assignor to Frank M. Auer; C. J. Auer and Paul B. Lindenmayer, all of Shreveport, La.

Continuation-in-part of Ser. No. 352,182, Feb. 25, 1982, Pat. No. 4,426,895. This application Jan. 19, 1984, Ser. No. 571,196
The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.
Int. Cl.³ B25B 17/00
U.S. Cl. 81—57.39 17 Claims



1. A ratchet wrench comprising:

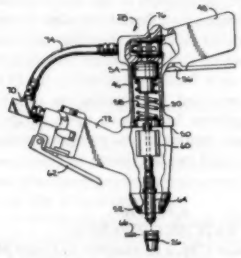
(a) a top housing and a top handle carried by said top housing;
(b) a bottom housing in rotatable cooperation with said top housing and a bottom handle carried by said bottom housing;
(c) a ratchet drum having a hollow interior and open at both ends, said ratchet drum rotatably located inside said top housing and said botton housing and drum teeth provided on the external surface of said ratchet drum;
(d) a shaft fixedly spanning an inside diameter of said ratchet drum and a pair of drum bevel gears rotatably mounted on said shaft in oppositely-disposed relationship;
(e) a top bevel gear removably disposed in said top housing and engaging said drum bevel gears;
(f) a drive bevel gear rotatably deployed in said bottom housing opposite and spaced from said top bevel gear and engaging said drum bevel gears and a socket drive carried by said drive bevel gear and extending through said bottom housing; and
(g) first ratchet means carried by said top housing and said top handle and second ratchet means carried by said bottom housing and said bottom handle, said first ratchet means and said second ratchet means selectively cooperating with said drum teeth in said ratchet drum, whereby engagement of said drum teeth in a selected orientation by said first ratchet means and said second ratchet means causes rotation of said ratchet drum in a selected direction and rotation of said top bevel gear and selective rotation of said drum bevel gears to drive said drive bevel gear responsive to rotatable manipulation of said top handle and said bottom handle.

4,507,991

APPARATUS FOR INSTALLING FASTENERS

Stuart H. Lemke, Rte. 2, Box 288C, Mukwonago, Wis. 53149

Filed Mar. 28, 1983, Ser. No. 479,456
Int. Cl.³ B25B *19/00*
U.S. Cl. 81—463 **10 Claims**



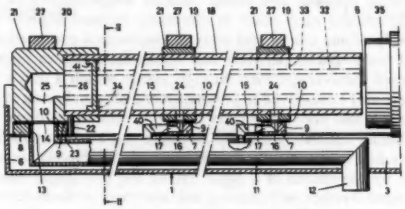
1. A tool for installing a threaded fastening device wherein the fastening device includes an internal channel extending substantially the entire length of the fastening device and terminating in an opening in the head of the fastening device; a barb assembly contained in the channel and sidewall openings in the tip of the fastening device to allow the barb to exit from the channel, the tool comprising:
a casing having a handle portion, a body portion and a tip portion,
fastening device engaging means disposed adjacent said tip portion,
rotating means operably connected to said fastening device engaging means for rotating said fastening device engaging means and in turn rotating the threaded fastening device to screw the fastening device into the materials to be joined,
barb assembly engaging means extendable from said casing out through said tip portion for contacting the barb assembly and forcing the barb downwardly and out through the sidewall openings, and
extension means connected to said barb asesmbly engaging means for extending said barb assembly engaging means from said casing and into contact with the barb assembly.

4,507,992

BAR-GUIDANCE EQUIPMENT FOR AN AUTOMATIC LATHE

Claude A. Vandevoir, La Neuveville, and Markus Geiser, Péry, both of Switzerland, assignors to Sameca S.A., Bienne, Switzerland

PCT No. PCT/CH81/00084, § 371 Date Mar. 17, 1982, § 102(e) Date Mar. 17, 1982, PCT Pub. No. WO82/00262, PCT Pub. Date Feb. 4, 1982
PCT Filed Jul. 20, 1981, Ser. No. 361,919
Claims priority, application Switzerland, Jul. 18, 1980, 5499/80
Int. Cl.³ B23B *13/08*
U.S. Cl. 82—2.7 **10 Claims**



1. A device for guiding the various workpiece bars which can be machined in an automatic lathe, comprising:
at least two interchangeable guidance tubes of different diameters, each being alignable with the lathe headstock spindle to support that part of a workpiece bar which extends to the rear of the lathe;
fastening members disposed at at least three points distributed along the guidance tubes for rigidly connecting the tubes to a reinforcing element extending along the entire length of the tubes.

4,507,993

MACHINE TOOL WITH TWO SPEED TURRET INDEXING

Martin L. Silverman, South Euclid, and Donald P. Shook, Cleveland Heights, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Mar. 24, 1983, Ser. No. 478,405
Int. Cl.³ B23B *29/24, 3/16, 7/04;* B23Q *17/00*
U.S. Cl. 82—36 A **8 Claims**

1. A turning machine, comprising:
(a) a numerical control for controlling operation of the machine;
(b) a turret which is indexible about the center axis thereof to various work stations for bringing tools, supported on the turret, into position for machining a workpiece that is mounted on the machine;
(c) an elongated turret bar secured to the turret for unitary axial and rotational movement therewith, the bar extending from the turret and having a longitudinal axis which coincides with the center axis of the turret;
(d) means associated with the turret for shifting the turret and attached bar axially between an unclamped position, where the turret can be indexed by rotating it about the center axis, and a clamped position, where the turret is held against rotation and indexing, the means including:
(I) a first cam and a second cam secured to the bar in spaced relation from the turret for unitary axial and

rotational movement therewith, the cams being spaced longitudinally apart on the bar a distance which is correlated to the axial distance which the bar and turret shift between the clamped and unclamped positions;

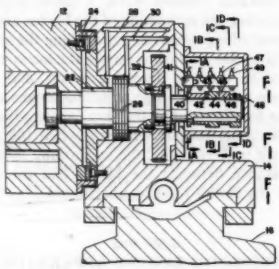
(II) a first sensor and a second sensor fixedly disposed adjacent the cams in spaced relation along the longitudinal axis of the bar, such that the first sensor senses the first cam when the turret is in the clamped position and the second sensor senses the second cam when the turret is in the unclamped position, the sensors designed to sense the cams and, accordingly, send signals to the control.

(e) means coacting with the bar for rotating the turret from one work station to another, when the turret is in the unclamped position, the turret rotating means including:

(III) means operatively connected to the bar for rotating the turret from a work station at a predetermined speed;

(IV) means operatively coupled to the bar for slowing down rotation of the turret to a slower speed when the turret reaches a predetermined distance from the work station to which the turret is being rotated;

(V) a plurality of indexing cams secured to the bar, adjacent the first and second cams, for unitary axial and rotational movement with the bar and turret, the indexing cams being shaped in correlated relation to the rotary positions of the turret in relation to the work stations to which the turret is indexed;



(VI) a separate indexing sensor associated with each of the indexing cams and fixed disposed adjacent thereto to sense the rotary positions of the indexing cams, the size of the indexing cams and associated sensors being correlated, such that the indexing sensors will be in sensing relationship with the indexing cams when the turret is in the clamped and unclamped positions and is moving therebetween;

(VII) a final positioning cam operatively connected to the bar and rotatable therewith at a predetermined multiple of the speed at which the bar and turret rotate;

(VIII) means associated with the final positioning cam for sensing a feature of the final positioning cam and sending a corresponding signal to the control to halt indexing of the turret in a position suitable for clamping; and

(f) means coacting with the bar for clamping the turret against rotation and indexing when the turret is in the clamped position.

4,507,994

DEVICE FOR MONITORING A CYLINDER-PISTON ASSEMBLY

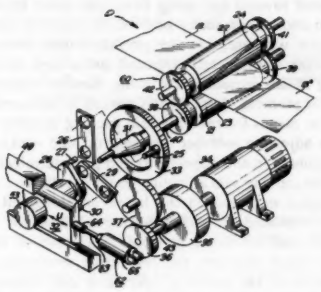
Wolfgang Meurer, Buderich, Fed. Rep. of Germany, assignor to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 164,447, Jun. 30, 1980, abandoned, which is a continuation of Ser. No. 029,164, Apr. 11, 1979, abandoned. This application May 9, 1983, Ser. No. 492,770

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1978, 2815489

Int. Cl.[3] **B26D** *1/62, 7/24*

U.S. Cl. 83—58 **7 Claims**



1. In a web crosscutter having two blade drums, means for linking the two drums for adjusting the angular velocity thereof including a positionable slide and means for clamping the slide in a selected position including levers, a cylinder piston assembly for exerting the requisite clamping force on the levers, the improvement comprising means for monitoring the clamping force generated by the cylinder-piston assembly comprising spring means mounted between the cylinder-piston assembly and the levers to transmit the force generated by the cylinder-piston assembly to effect movement of a first portion thereof with respect to a second portion and actuatable switching means comprising a first switching element mounted for movement with said first portion of the spring means and a second switching element fixedly mounted to the second portion of the spring means, the two switching elements configured to actuate the switching means when a predetermined path of travel of the first portion of the spring means is exceeded to effect a stopping of the drive of the crosscutter blade drums.

4,507,995

ARRANGEMENT FOR REMOVING WORKPIECES FROM A CUTTING PRESS

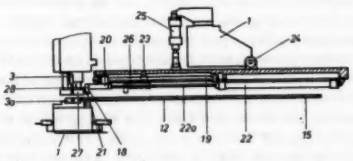
Walter Bredow, Alfeld, Fed. Rep. of Germany, assignor to C. Behrens AG, Alfeld, Fed. Rep. of Germany

Filed Oct. 26, 1981, Ser. No. 315,208

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1980, 3042717

Int. Cl.[3] **B26D** *7/18*

U.S. Cl. 83—153 **8 Claims**



1. An arrangement for removing plateshaped workpieces

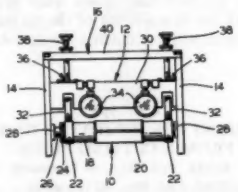
from a cutting press including a frame, a support table mounted on the frame and having a support surface for the workpieces extending along the plane and operative for advancing the workpieces along the support surface toward machining a severing zones of the support table, and machining and severing devices respectively arranged at the machining and severing zones, comprising means for entraining the respective workpiece at the severing zone outside of the operating range of the severing device and for transporting the entrained workpiece in a predetermined direction away from the severing zone, said entraining means being mounted on the machine frame upwardly of the support surface of the support table for movement toward and away from said plane between a rest position and an entraining position in which it transports the respective workpiece in the predetermined direction while being always completely disposed above said plane, said entraining means including a rocking member mounted on the frame for pivoting about an axis normal to said predetermined direction; means for pivoting said rocking member about said axis; an adjusting member mounted on said rocking member for movement in and opposite to said predetermined direction; means for moving said adjusting member relative to said rocking member mounted on the latter; an elongated entraining member mounted on said adjusting member for movement therewith and extending to above the zone of the support surface which supports the respective workpiece after the termination of the severing operation; and conveyor means arranged along the path of transportation of the workpieces downstream of said entraining means and operative for removing the workpieces out of the range of operation of said entraining means.

4,507,996

DEVICE FOR TRANSFERRING AND MONITORING LOAD TO DIE ROLL

Martin Kesten, West Hartford, Conn., assignor to Preston Engravers, Inc., Windsor, Conn.

Filed Nov. 15, 1982, Ser. No. 441,638
Int. Cl.³ B26D *1/42*
U.S. Cl. 83—344 **7 Claims**



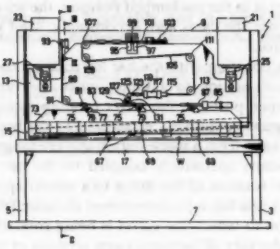
1. A device for transferring and monitoring the load applied to a die cutting roll in a press, comprising an elongated body dimensioned and configured for mounting between the frame portions of the press across the die cutting station thereof, and having load-bearing and pressure-indicating means therein, said means including a pair of load-bearing members disposed adjacent the opposite ends of said body and on one side thereof for contact by force-applying means of the press, and a pair of pressure indicators, one operatively connected to each of said load-bearing members, said body also having means for transferring the applied force to a die cutting roll mounted in the press to the opposite side of said body, whereby said body is adapted to receive a two-point load and to enable balancing of the forces transferred therethrough.

4,507,997

SHEARING MACHINE

Hidekatsu Ikeda, Hatano, Japan, assignor to Amada Company, Limited, Japan

Filed Jan. 26, 1982, Ser. No. 342,923
Claims priority, application Japan, Jan. 30, 1981, 56-011086; Feb. 10, 1981, 56-017517; Feb. 10, 1981, 56-017518
Int. Cl.³ B26D *7/26*
U.S. Cl. 83—368 **9 Claims**



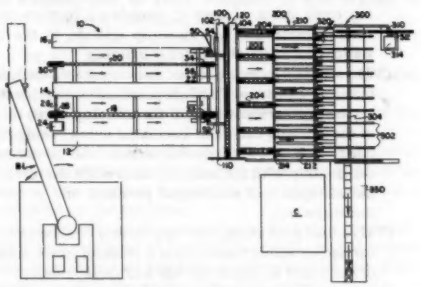
1. A shearing machine comprising a detecting means for detecting the thickness of a workpiece placed on a work-table, a clearance adjusting means for moving at least one of the upper and lower blades toward and away from the other to adjust the clearance therebetween, a shear angle adjusting means for adjusting the inclination of the blades with respect to each other, controlling means for controlling the adjustment of both adjusting means according to the thickness of the workpiece detected by the said detecting means, and means connected between said shear angle adjusting means and the controlling means for disengaging the shear angle adjusting means from the controlling means, whereby when the shear angle adjusting means is disengaged, the controlling means controls only the clearance between the blades and the shear angle inclination of the blades remains unchanged.

4,507,998

FIREWOOD SAWING APPARATUS

Johnny H. Lambert, Meadows of Dan, Va.; Didier Primat, Collonge-Bellerive, Switzerland; William H. Edmiston; Johnny J. Edmiston, both of Lenoir, N.C., and James H. Edmiston, Boomer, N.C., assignors to Primlumber, Inc., Meadows of Dan, Va.

Filed Sep. 2, 1982, Ser. No. 414,096
Int. Cl.³ B27B *7/00*
U.S. Cl. 83—419 **10 Claims**



1. A firewood sawing apparatus comprising:
(a) a loading deck having an upper surface onto which logs are initially placed in parallel arrangement and means for advancing said logs in a direction transverse to the longitudinal axis thereof to a discharge end;

(b) a feed conveyor means positioned adjacent the discharge end of said loading deck for receiving logs deposited thereon and advancing means for moving logs in a serially spaced arrangement in a direction transverse to the longitudinal axis thereof to a feed conveyor discharge end;

(c) an aligning trough positioned between said loading deck and said feed conveyor for shifting all logs deposited in said aligning trough against a bumper at one end thereof; and means for depositing said logs one at a time from said loading deck onto said aligning trough; whereby one end of all logs proceed through said feed conveyor and said sawing means in a common longitudinal plane such that the initial end of the log cut by the first saw will be substantially of the same length from all logs;

(d) sawing means adjacent said feed conveyor discharge end for receiving logs discharged therefrom, said sawing means comprising a plurality of longitudinally spaced, circular saws mounted along a common axis extending parallel to the longitudinal axis of said logs being discharged;

(e) whereby logs are presented one at a time to the sawing means and a single log is cut simultaneously into a plurality of firewood pieces.

4,507,999

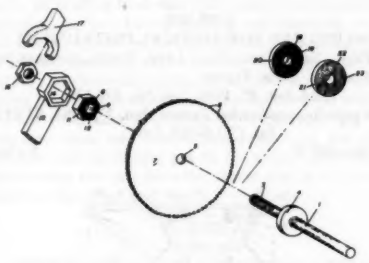
SAW RETAINING ARRANGEMENT

Morris L. Dezern, 10609 Harrison, Fairdale, Ky. 40218

Filed Jul. 26, 1982, Ser. No. 402,088

Int. Cl.³ B26D *1/12*; B23D *45/16*

U.S. Cl. 83—665 **5 Claims**



1. A circular saw retaining arrangement including a circular saw blade with a central aperture, a driven arbor shaft including an arbor plate located a selected distance from the end of the arbor shaft where a first portion of arbor shaft between the arbor plate and the end of the arbor shaft is threaded to receive an arbor nut, collar means of selected periphery thereof and having generally planar first and second surfaces on opposite sides thereof with a central aperture therein to receive said first portion of said arbor shaft for location of the collar between the arbor nut and the saw blade and wherein said first planar surface of said collar means is adapted to be urged against the saw blade with the arbor nut threaded on the arbor shaft and the arbor nut tightened against said second surface of said collar opposite said first surface and wherein said first surface of the collar means is roughened to restrict relative movement between said first surface and said circular saw blade.

4,508,000

FREQUENCY-SELECTABLE SIGNAL GENERATOR

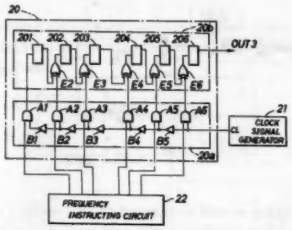
Fuminori Suzuki, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1983, Ser. No. 487,422

Claims priority, application Japan, Apr. 23, 1982, 57-68447; May 28, 1982, 57-89737

Int. Cl.³ G10H *5/06*

U.S. Cl. 84—1.01 **4 Claims**



1. A frequency-selectable signal generator comprising:

reference signal generator means for generating clock signals;

frequency instructing means for supplying parallel numeric datum pertaining to a given frequency to be generated; and

accumulator means having first input terminal means for receiving said parallel numeric datum and second input terminal means for receiving the clock signals from said reference signal generator means, which are used to enable the accumulator means to accumulate said parallel numeric datum, said accumulator means including a binary counter composed of a series alternation of flip-flops and exclusive OR gates, and a drive circuit connected to said exclusive OR gates via bus conductors, thus enabling said drive circuit to drive said binary counter via said bus conductors synchronously with said clock signals,

whereby when said parallel numeric datum is supplied to said first input terminal means of said accumulator means and when said clock signals are supplied to said second input terminal means of said accumulator means, said accumulator means performing addition of the number represented by said parallel numeric datum for every one clock pulse, thus outputting an overflow signal whose frequency is proportional to the number represented by said parallel numeric datum.

4,508,001

ELECTRONIC MUSICAL INSTRUMENT USING LARGE-CAPACITY RECORDING MEDIUM

Hideo Suzuki, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 24, 1984, Ser. No. 633,940

Claims priority, application Japan, Jul. 29, 1983, 58/137575

Int. Cl.³ G10H *1/00*

U.S. Cl. 84—1.01 **16 Claims**

1. An electronic musical instrument comprising:

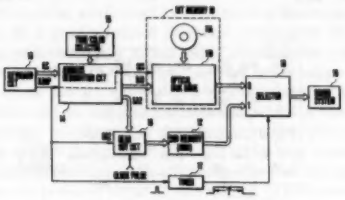
first memory means having a large capacity and of a low-speed access type for storing first waveform data corresponding to a first portion from a first point to a second point of a tone waveshape of a tone to be produced;

second memory means, which is smaller in capacity and faster in access than those of said first memory, for storing second waveform data corresponding to a second portion form a third point to a fourth point of said tone waveshape, said third point, said fourth point, said first point and said second point being in this order on time series and time length corresponding to said second portion being equal to or longer than an access time required to indepen-

dently read out data corresponding to said first point from said first memory;

read out means for reading out said second waveform data and said first waveform data from said second memory means and said first memory means respectively;

control means for generating a control signal relating to said time length corresponding to said second portion;



delivering means connected to said second memory means, said first memory means and said control means, for delivering said second waveform data firstly and then for delivering said first waveform data in accordance with said control signal; and

tone production means for producing a tone in accordance with said selected second waveform data and said delivered first waveform data.

4,508,002

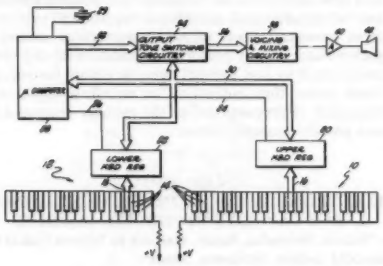
METHOD AND APPARATUS FOR IMPROVED AUTOMATIC HARMONIZATION

George R. Hall, Sherman Oaks; Robert J. Hall, Chatsworth, and Jack C. Cookerly, Saugus, all of Calif., assignors to Norlin Industries, White Plaines, N.Y.

Continuation-in-part of Ser. No. 3,584, Jan. 15, 1979, abandoned. This application Jun. 17, 1981, Ser. No. 274,606

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **18 Claims**



1. A method for embellishing a melody represented by the actuation during a time frame of one or more playing keys of a musical instrument keyboard, which instrument is capable of sounding at least one chord selected during the time frame, said method comprising the steps, accomplished by the instrument itself, of:

recognizing at least one note of the melody during the time frame;

recognizing a chord selected during the time frame;

deriving, for at least one note of the melody, at least one accompaniment note which is not a tone of the recognized chord and yet is harmonically related to said melody note and the recognized chord; and

sounding said melody note and said at least one accompaniment note to produce an embellished melody.

4,508,003

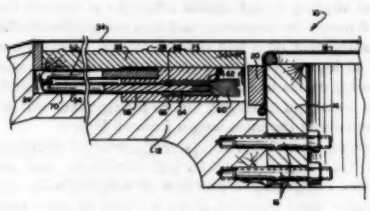
TRUSS ROD APPARATUS

Peter H. Smakula, 2077 Cornell Rd., Cleveland, Ohio 44106

Filed Sep. 30, 1982, Ser. No. 428,625

Int. Cl.³ G10D *3/00*

U.S. Cl. 84—293 **13 Claims**



1. An apparatus for adjusting neck curvature in a stringed musical instrument, comprising:

(a) a first elongate member having a first end and a second end;

(b) a second elongate member positioned adjacent to and parallel to said first elongate member, the second elongate member having a first end and a second end, the first end of the second elongate member being fixedly connected to the first end of the first elongate member;

(c) anchoring means to which the second end of the first elongate member is fixedly attached, the anchoring means being positioned at one end of the musical instrument neck; and

(d) rod length adjusting means threadedly engaged to said anchoring means and said second end of said second elongate member, so that upon movement of said rod length adjusting means in one direction or another, said rod length adjusting means applies a tension force or a compressive force, respectively, to said second elongate member.

4,508,004

SEALING PAD FOR MUSICAL INSTRUMENT

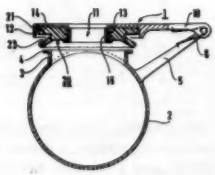
Gérard Pages, Saint Germain en Laye, France, assignor to Le Joint Francais, Paris, France

Filed Jan. 27, 1984, Ser. No. 574,430

Claims priority, application France, Jan. 27, 1983, 83 01213

Int. Cl.³ G10D *9/04*

U.S. Cl. 84—385 P **8 Claims**



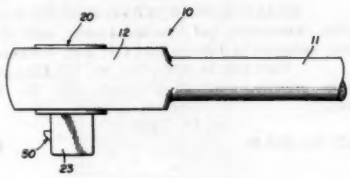
1. A sealing pad for a key of a woodwind or like musical instrument, said instrument comprising a hollow body pierced by circular tone holes, respective finger-actuated keys pivotably mounted to said body, said keys including a disc overlying a respective tone hole for movement towards said body for closing of said tone hole, said keys being optionally pierced by further respective holes, said pad comprising a first annular portion for fixedly mounting to said key beneath said disc and an annular lip underlying said first annular portion of said pad being free of said first annular portion and being flexible and movable relative to said first annular portion, and wherein said disc, said first annular portion and said annular lip being of a

diameter in excess of the diameter of said tone hole such that said movable annular lip is capable of being pinched between said first annular portion of said pad and the rim of said tone hole when said key is pivoted towards said body, and said tone hole is closed by said pad.

4,508,005
QUICK RELEASE MECHANISM FOR RATCHET WRENCH

Timm R. Herman, and Frank Mikic, both of Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Dec. 19, 1983, Ser. No. 563,196
Int. Cl.³ B25B *13/00*
U.S. Cl. 81—177 G **18 Claims**



1. Mechanism for locking and releasing an elongated socket having a side hole, comprising a generally cylindrical body, a non-annular stud extending from said body and being coaxial therewith, said body and said stud having an axially extending first bore therein, an abutment in said first bore, a formed-spring actuator slidable in said first bore and having first and second end portions and an intermediate portion, said intermediate portion at rest lying against said abutment, said first end portion being oriented so as to be movable by a person's finger, said stud having a second bore therein extending substantially normal to said first bore, a pin slidably located in said second bore and movable between locking and release positions, said second end portion engaging said pin, said pin being biased toward its locking position, said pin having a portion transversely protruding from said stud in said locking position, said protruding portion having locking and camming surfaces, a socket being applied to said mechanism by pushing the socket against said camming surface to move said pin to its release position and then pushing the socket until said pin snaps to its locking position and into the socket side hole, the socket being removed from said mechanism by depressing said first end portion to cause said intermediate portion to ride along said abutment and carry said pin to its release position, thereby withdrawing said pin from the socket side hole to enable the socket to slip off of said stud.

4,508,006
DEVICE FOR QUICKLY STOPPING A REMOTE CONTROLLED AUTOMATIC CANNON

Lothar Post, Düsseldorf, and Bernhard Schneider, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 26, 1982, Ser. No. 371,965
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1981, 3116541
Int. Cl.³ F41F *11/04*
U.S. Cl. 89—24 **6 Claims**

1. A device for quickly stopping a remote controlled automatic cannon having a breech block which can be moved by means of an endless control groove in an essentially rotationally symmetrical control roller, wherein each region of the control groove is associated with a respective function step within the firing cycle of the cannon, said device comprising in combination:

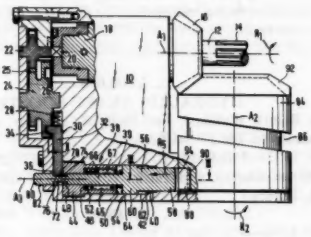
an element which rotates in dependence on the rotation of said control roller, said element being provided with a stop abutment which is associated with a particular region of said control groove in said control roller;

a control piston having a first free end and a second free end, said piston being mounted adjacent said element such that its said first free end can be axially moved into and out of the circular path of movement of said stop abutment;

means, including a drive shaft, for driving said control roller;

means for applying an axial force on said piston to normally move said first free end into said path of movement and thus into a blocking position with respect to said stop abutment;

means for applying propellant gases developed during firing of the cannon to said piston to move said first free end out



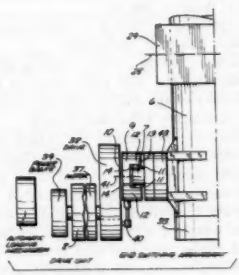
of said path of movement of said stop abutment and thus into a release position with respect to said stop abutment; and

means for holding said control piston in said release position for a defined period during a firing cycle, said means for holding said control piston in said release position including, a recess formed in the peripheral surface of said second free end of said control piston, a control member, means for mounting said control member so that it is movable transversely to the longitudinal axis of said piston into and out of said recess, and means for moving said control member in dependence on the rotary movement of the drive shaft for said control roller.

4,508,007
LOCKING ARRANGEMENT FOR THE ELEVATING MECHANISM OF A GUN BARREL

Marold Elspass, Kaast, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 20, 1983, Ser. No. 459,688
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204721
Int. Cl.³ F41F *21/00*
U.S. Cl. 89—37.11 **9 Claims**



1. An improved weapon having a gun barrel and a gun elevating and gun traversing mechanism respectively operatively connected to said gun barrel, a separate fully automatic

loading mechanism also being operatively mounted in said weapon, the improvement comprising in combination,

a locking arrangement operatively connected to said gun elevating mechanism and to said gun traversing mechanism,

said gun barrel being mounted in said gun elevating mechanism and being adapted to be precisely maintained in a predetermined index position during loading by said locking arrangement,

wherein said gun elevating mechanism includes a gun barrel support, a bolt rigidly secured to said gun barrel support, a drive and brake unit operatively connected to said gun traversing mechanism, a claw being operatively connected to said drive and brake unit, said claw and bolt forming part of said locking arrangement and said index position being maintained by the claw lockingly clamping said bolt.

4,508,008

HYDRAULIC BRAKE BOOSTER

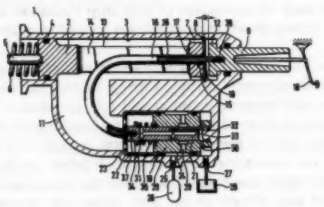
Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 5, 1982, Ser. No. 375,256

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1981, 3128317

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—372 **6 Claims**



1. In a hydraulic booster, especially for use in actuating a master cylinder arrangement of a vehicle braking system, a combination comprising:

a main housing defining an elongated bore;

a booster piston received in said bore for longitudinal displacement;

an operating element mounted partially in said bore for selective translation relative to said housing between a rest position and a plurality of operating positions;

means for defining a pressure chamber, said pressure chamber bounded at one end by a face of said operating element disposed in said bore, and bounded at the other end by a face of said booster piston;

means for supplying a fluid at a controllable pressure into said pressure chamber, including:

a control valve including a valve housing and a valve member movable therein, said valve housing having an elongated internal passage and at least one outlet and one inlet port communicating with said passage,

means for admitting the fluid to one of said ports at a control pressure which differs by a predetermined amount from a nominal reference pressure at said other port,

said control valve member accommodated in said passage for movement longitudinally thereof between an inactive position in which it establishes communication only between said outlet port and said pressure chamber and a plurality of active positions in which it establishes communication between said inlet port and said pressure chamber, and

means for moving said control valve member between said inactive and active positions thereof relative to said control valve housing in dependence on the position of said operating element relative to said booster piston, said moving means including

an elongated tubular element having two longitudinally spaced portions respectively secured to said booster piston and to a stationary guide within said main housing, and

a deformable elongated force-transmitting body of substantially constant length at least partially received in said tubular element for displacement relative thereto and operatively connected to said operating element and to said control valve member for joint movement therewith such that said control valve member is in said inactive position when said operating element is in said rest position.

4,508,009

BRAKE POWER SERVO BOOSTER

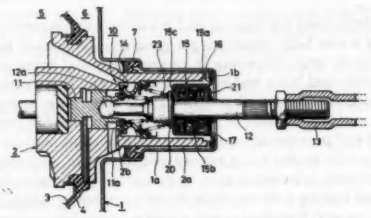
Morihiko Shimamura, and Shintaro Uyama, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1983, Ser. No. 515,424

Claims priority, application Japan, Jul. 20, 1982, 57-109864[U]

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—376 R **10 Claims**



1. In a brake power servo booster including a stationary stop provided on a cylindrical projection of a rear shell, and a movable stop provided on an input shaft connected between a brake pedal and a valve mechanism, and operationally associated with said stationary stop to restrict a retracted position of said input shaft, the improvement which comprises an intermediate stop member disposed in said cylindrical projection to be slidable relative to said cylindrical member in the axial direction of said shaft during operation of said shaft, and having its retraction restricted by said stationary stop, said input shaft extending slidably through said intermediate stop member, said movable stop being adapted for abutment on said intermediate stop member to restrict said retracted position of said input shaft.

4,508,010

HYDRAULIC MOTOR

Rudolf Bock, Palmerstrasse 9, 7031 Holzgerlingen, Fed. Rep. of Germany

Filed May 31, 1983, Ser. No. 499,235

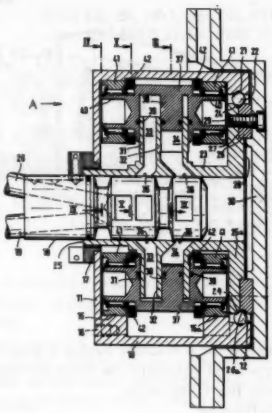
Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220492

Int. Cl.³ F01B *1/06, 13/06;* F04B *1/10*

U.S. Cl. 91—474 **6 Claims**

1. A multi-piston hydraulic motor, comprising a stationary housing; a rotor having a central axis of rotation and mounted in said housing, said rotor having a plurality of hollow radially extending pistons spaced from each other in a circumferential direction; a plurality of cup-shaped cylinders located in said housing and spaced from each other in the circumferential direction, each cylinder being mounted on and displaceable over the respective piston, said housing having two cam tracks spaced from each other in an axial direction of the rotor, each of said cylinders having two journals extending oppositely in

said axial direction, each of said journals having axes and carrying a control roller abutting against the respective cam track and cooperating therewith; a central control shaft concentrically mounted in said rotor and conveying a pressure fluid, said control shaft communicating with said hollow pistons to feed the pressure fluid to said hollow pistons, said rotor having a flange portion on a driven side thereof, said flange



portion being coaxial with said central axis; said rotor being mounted in said stationary housing by a single roller bearing formed as a four-point ball bearing to absorb radial forces and axial forces in both axial directions exerted on said rotor in operation, said bearing being positioned between said flange portion and said housing and being radially outwardly offset at a greater distance from said central axis than the axes of said journals.

4,508,011

HYDRAULIC AXIAL PISTON MACHINE

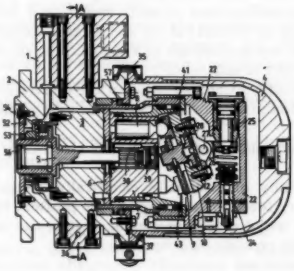
Wilhelm Nolden, Wiesbaden, Fed. Rep. of Germany, assignor to Abex Corporation, Stamford, Conn.

Filed Mar. 29, 1983, Ser. No. 480,167

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3212402; Apr. 2, 1983, 3212374; Apr. 2, 1983, 3212429

Int. Cl.³ F01B *3/00, 13/04;* **F04B** *1/26*

U.S. Cl. 91—506 **12 Claims**



1. A hydraulic, axial piston machine comprising: a housing, a barrel, means for rotatably mounting the barrel in the housing, a port plate engaged by one end of the barrel, a plurality of equally spaced circumferentially arranged piston bores in the barrel, a plurality of pistons of which one is mounted in each piston bore, a swash plate, wherein one end of each piston is engaged with the swash plate, a yoke, means for mounting the swash plate on the yoke, a pair of trunnions anchored in the housing, means for connecting the yoke to the trunnions, a control base in the housing, means mounted in the control base for pivoting the yoke about the axis of the trunnions, wherein the yoke pivots between a first position of minimum fluid displacement in which the plane of the swash plate is perpendicular to the axis of the barrel and the pistons do not reciprocate when the barrel is rotated and a second position of maximum fluid displacement in which the plane of the swash plate is at a maximum angle with respect to the axis of the barrel and the pistons move a maximum distance when the barrel is rotated, roller bearing means supported in the control base, a rigid disc mounted on the bearing means, a curved surface formed on the rear of the yoke wherein the curved rear surface of the yoke is supported on the disc such that the disc moves linearly as the yoke is pivoted and the load on the swash plate is transmitted through the yoke and the disc to the bearing means.

4,508,012

HIGH PRESSURE HYDRAULIC SYSTEMS

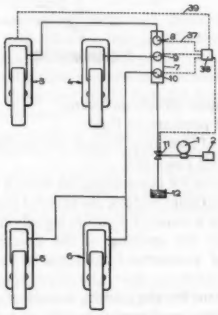
Desmond H. J. Reynolds, and Phillip A. Taft, both of West Midlands, England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Nov. 14, 1983, Ser. No. 551,122

Claims priority, application United Kingdom, Nov. 24, 1982, 8233554

Int. Cl.³ F15B *13/044, 13/06*

U.S. Cl. 91—512 **15 Claims**



1. A high pressure hydraulic system comprising a source of hydraulic pressure, a control valve assembly and a slave unit, fluid under pressure being supplied to said slave unit from said source through said control valve assembly, said control valve assembly comprising a housing provided with first and second ports, said first port communicating with said source and said second port communicating with said slave unit, and valve means controlling fluid flow between said ports, said valve means being movable to close either said first port or said second port or to permit communication between said ports, said valve means comprising first and second relatively movable valve members, first and second biassing means, means for applying a pressure differential across each said valve member, and a solenoid means, said first valve member controlling flow through said first port, and being operated by forces produced by said first biassing means, said solenoid means and said pressure differential applying means, said first biassing force urging the first valve member to close said first port, and being less than said solenoid force urging said first valve member to open said first port, said solenoid force being of a predetermined value such that if said first biassing force and said pressure differential force together oppose and exceed said predetermined solenoid force, said solenoid means is unable to move said first valve member to open said first port; and said second valve member controlling flow through said second port, said

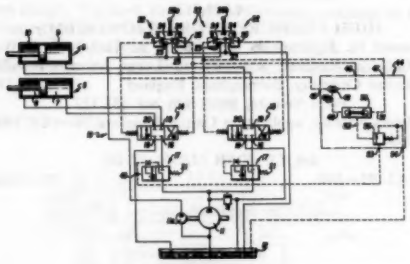
second valve member being operated by said first valve member, and by forces produced by said pressure differential applying means and said second biassing means, said second biassing force urging said second valve member to close said second port, and said control valve assembly incorporates elastomeric sealing means to provide a substantially leakproof seal when said first port is closed.

4,508,013

REMOTE CONTROLLED HYDRAULIC CIRCUIT HAVING SELECTOR MEANS FOR ESTABLISHING PRIORITY THEREIN

Rino O. Barbagli, Borgaretto, Italy, assignor to Fiatallis Europe, S.p.A., Lecce, Italy

Filed Apr. 27, 1983, Ser. No. 489,051
Claims priority, application Italy, Jun. 14, 1982, 67764 A/82
Int. Cl.³ F15B *11/00*
U.S. Cl. 91—516 **3 Claims**



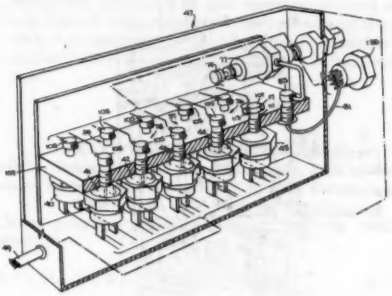
1. A hydraulic circuit including:
a source of pressurized fluid;
a plurality of hydraulic motors connectible to the source of pressurized fluid, and
control means for connecting the source of pressurized fluid to the hydraulic motors, the control means being remotely piloted by a series of pressure signals each of which corresponds to the opening of the connection between the source of pressurized fluid and a respective hydraulic motor,
selector means for the priority supply of pressurized fluid to one or more preferential hydraulic motor chambers, the selector means being intended to detect, when they are active, the pressure signals corresponding to the supply of pressurized fluid to the preferential hydraulic motors and, in this condition, to render inoperative the control means associated with the other hydraulic motors, should they already have been activated to effect the supply of the other hydraulic motors, said selector means including a main selector valve comprising:
a first inlet which, when at least one of the pressure signals corresponding to the supply of pressurized fluid to the preferential hydraulic motors is active, receives this pressure signal;
a second inlet which, when at least one of the pressure signals corresponding to the supply of pressurized fluid into the non-preferential hydraulic motors is active, receives this pressure signal;
an outlet which is supplied with pressurized fluid when the first inlet and the second inlet receive a pressure signal,
actuator means which is activated by the pressurized fluid from said outlet, a first outlet communicating with a drain tank and a second outlet connected to the control means associated with non-preferential hydraulic motors, and in that the actuator means comprises piston means that puts the first outlet into communication with the second outlet when the outlet of the main selector valve is supplied with pressurized fluid.

4,508,014

REMOTE CONTROL APPARATUS FOR A MACHINE SUCH AS A CRANE

Bernell D. Shoff, Windsor, Pa., assignor to U.S. Truck Cranes, Inc., York, Pa.

Filed Jun. 8, 1982, Ser. No. 386,270
Int. Cl.³ F15B *13/08*
U.S. Cl. 91—527 **8 Claims**



5. A control apparatus for a machine having a plurality of machine functions operated hydraulically from pressure derived from a hydraulic line comprising:
(a) a source of pressurized air;
(b) a pneumatic to electric converter assembly comprising:
a plurality of normally open electrical pressure switches each adapted to be activated by air pressure at an inlet thereof, and
a normally closed electrical pressure switch adapted to be activated by air pressure at an inlet thereof;
(c) a remote control apparatus comprising:
a plurality of three position pneumatic switches connected in sequence to receive pressurized air from said air source via a main tube, each pneumatic switch having an inlet and two active outlets,
actuation of any of said three position pneumatic switches into a first or second active position causing pressurized air to be provided at a corresponding first or second outlet port of said three position pneumatic switch, and
a two position pneumatic switch having an inlet and an outlet connected in said sequence to receive pressurized air at its inlet;
(d) a pneumatic valve having an inlet port, an outlet port and an exhaust port, said outlet port being connected to the inlet of said normally-closed pressure switch and said exhaust port venting air pressure at the inlet of said normally closed pressure switch in response to a reduction in air pressure at said inlet port of said valve;
(e) a tube assembly extending between said converter assembly and said remote control apparatus, said tube assembly comprising:
(i) said main tube which is essentialy electrically non-conducting,
(ii) a plurality of essentially electrically non-conducting secondary tubes for transmitting air pressure from a respective outlet of said pneumatic switches to an inlet of respective pressure switches, and
(iii) an additional essentially electrically non-conducting secondary tube for transmitting air pressure from the outlet of said two position pneumatic switch to the inlet of said normally-closed electrical pressure switch;
(f) an electrical switch apparatus comprising:
(i) a plurality of electric switches connected in parallel with corresponding pressure switches and coupled to respective electrically operated function valves,
(ii) an electric switch connected in parallel with said normally-closed pressure switch and coupled so that operation of

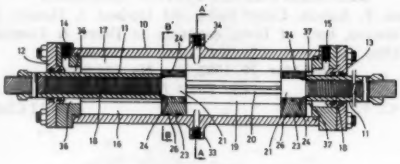
said electric switch dumps the pressure from the main hydraulic line.

4,508,015

HYDRAULIC CYLINDER

Weihwang Lin, No. 33, Lane 199, Kung Yuan 2 Rd., Kaohsiung, Taiwan

Filed Jul. 29, 1983, Ser. No. 518,460
Int. Cl.³ F01B *21/04;* F01C *9/00*
U.S. Cl. 92—2 **5 Claims**



1. A hydraulic cylinder comprising:

a cylinder having two closed ends for receiving a hydraulic fluid;

a rotor mounted for rotation about the axis of said cylinder;

two circular piston members respectively sleeved onto two ends of said rotor and having their peripheries sealingly engaged with an inner surface of said cylinder, said piston members bounding a first fluid tight arcuate chamber with the peripheral surface of said rotor and the inner surface of said cylinder, each of said piston members bounding, a second fluid tight chamber at one side of said first chamber, with the inner surface of said cylinder and one of said closed ends;

vane means provided on said rotor and sealingly engaged with the inner surface of said cylinder;

barrier means provided in said first arcuate chamber, whereby said first arcuate chamber is divided by said barrier means and vane means into at least two variable volume regions of segmented arcuate shapes;

at least one piston rod attached to one end of said rotor in a coaxial relationship and slidably mounted through one of said closed ends in fluid tight relationship;

first port means for admitting and returning the hydraulic fluid respectively communicated with said second chambers; and

second port means for admitting and returning the hydraulic fluid respectively communicated with said two regions of said first arcuate chamber;

said vane means includes one vane member, and said barrier means includes one barrier member, said vane member and said barrier member dividing said first arcuate chamber into two regions of variable volume, said barrier member extending through said piston members and up to said closed ends of said cylinder, and in which each of said piston members includes a lateral notch for receiving said barrier member.

4,508,016

ROTARY ACTUATED SUPPORT

Paul P. Weyer, 48811 28th Ave. Southeast, Enumclaw, Wash. 98022

Filed Sep. 9, 1983, Ser. No. 530,977
Int. Cl.³ F01B *3/08*
U.S. Cl. 92—33 **10 Claims**

1. A fluid-powered, rotary actuated support for a crane or other device, comprising:

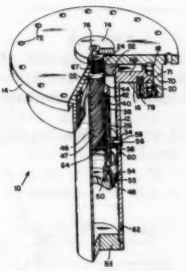
an elongated cylindricl body having ports for introducing pressurized fluid therein;

a platform concentric with said cylindrical body and rotatable relative thereto;

a radially extending bearing support joined to said cylindrical body and confronting said platform;

load-carrying bearing means disposed between said bearing support and said platform for allowng relative rotary motion between said platform and said bearing support, said bearing means being external to said body and not subject to said pressurized fluid therein, one of said platform or bearing support being subjected to bending loads disposed in a generally vertical plane from the weight of the crane or other device and its load;

an output shaft rotatably disposed within said body and having a drive end for providing rotational drive between said body and said platform;



flexible coupling means coupling said drive end of said output shaft to said platform for transferring rotational torque between said body and said platform without causing bending of said output shaft from said bending loads of said crane, said drive end being radially movable under said bending loads; and

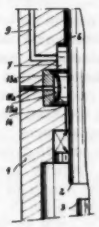
linear-to-rotary transmission means disposed within said body and operable to provide relative rotational movement between said body and said output shaft, said transmission means being operable while said output shaft drive end is subjected to said radial movement.

4,508,017

FLUID-CONTROL SYSTEM FOR A HYDRAULIC PERCUSSION INSTRUMENT

Roger Montabert, Lyons, France, assignor to Etablissements Montabert, Saint-Priest, France

Filed Jul. 14, 1982, Ser. No. 398,237
Claims priority, application France, Jul. 17, 1981, 81 14304
Int. Cl.³ B25D *9/06;* F16F *9/19*
U.S. Cl. 92—85 B **8 Claims**



1. In a hydraulic percussion implement having a body with a cylindrical bore centered on a generally vertical axis, a ram reciprocable in said bore and provided with a piston head received in an enlargement of said bore connectable to a source of hydraulic liquid under pressure, said body forming a seat for a tool at a lower end of said bore to be impacted by said ram in

a bottom position thereof, and seal means in said bore engaging a lower extremity of said ram, said bore being annularly recessed to form a hydraulically ineffectual drainage chamber at a level below said enlargement but above said seal means for collecting liquid leaking down alongside said ram, said drainage chamber having an outlet connected via a check valve to a low-pressure region,

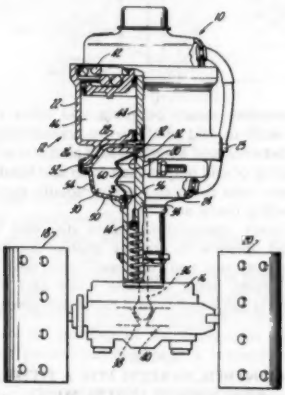
the combination therewith of a pneumatic buffer disposed in said body substantially at the level of and in communication with said drainage chamber in the vicinity thereof for absorbing hydraulic shocks generated by the impact of said ram upon said tool, said buffer comprising a flexible membrane forming at least part of an enclosure for a volume of gas and separating said volume from said drainage chamber.

4,508,018

BOOT ASSEMBLY FOR BRAKE ACTUATOR

Graydon J. Choinski, Utica, and Dave W. Brooks, Royal Oak, both of Mich., assignors to Thyssen-Bornemisza, Inc., New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,344
Int. Cl.³ F16J *15/18*
U.S. Cl. 92—128 **9 Claims**



1. In a brake actuator having a service section chamber housing connected to a second housing by means of a mounting tube extending at one end thereof a short distance into said service section chamber housing and including a piston assembly extending through said mounting tube movable therein for cooperation with mechanisms in the second housing to generate braking forces, the improvement comprising:

an annular groove formed in the outer peripheral surface of said one tube end within said chamber housing;

a flexible boot connected at one end to said piston assembly and including a sleeve portion at the other end fitted telescopically over said one tube end and having an axial length greater than the axial length of said groove, said sleeve portion having a generally smooth cylindrical outer wall and a generally smooth cylindrical inner wall extending, with uniform diameter, from said other boot end throughout the axial length of said sleeve portion, the diameter of said inner wall in the relaxed condition of said boot being at least as great as the outer diameter of said one tube end so as to facilitate fitting said sleeve portion over said one tube end; and

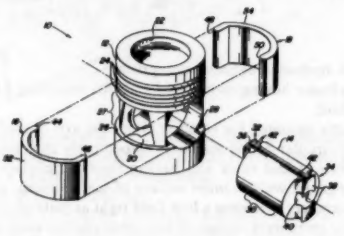
a rigid annular retainer ring surrounding said sleeve portion in the area of said annular groove having an axial length greater than the axial length of said groove and having an inner diameter less than the relaxed outer diameter of said sleeve portion but greater than the outer diameter of said one tibe end, said ring and said sleeve portion of said boot axially overlapping said groove entirely including both axial ends of said groove in the assembled relation of said ring, said boot and said one tube end so that said ring compressingly extrudes a portion of the inner wall of said sleeve portion into said annular groove to form an extruded inner bead axially filling said groove to preclude axial movement of said boot relative to said groove and thereby secure said boot to said one tube end.

4,508,019

REDUCED IMPACT PISTON ASSEMBLY

Dennis F. Kabele, Cedar Falls, and Herbert J. Hauser, Jr., Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 29, 1982, Ser. No. 362,816
Int. Cl.³ F01B *31/10*
U.S. Cl. 92—158 **12 Claims**



1. A reduced impact piston assembly comprising:

(a) a hollow cylindrical body having a piston pin bore formed therethrough and having an annular groove formed about its outer circumference which is centered relative to the axis of said cross-bore;

(b) a piston pin received in said piston pin bore and having an exposed intermediate portion for attachment of a connecting rod thereto, said piston pin further having first and second annular grooves formed distal first and second ends thereof; and

(c) a pair of C-shaped inserts positioned in said annular groove and adapted for constant engagement with a cylinder wall, the ends of said inserts engaging said annular grooves formed in said piston pin to prevent axial movement of said piston pin within said piston pin bore and to form a closed loop having a circumferential length which is greater than the circumferential length of said cylindrical body.

4,508,020

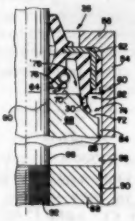
MULTI-FUNCTION FLUID SEAL FOR DAMPERS AND THE LIKE

Peter Szcupak, Park Ridge, Ill., assignor to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Filed Feb. 18, 1983, Ser. No. 467,597
Int. Cl.³ F16J *15/18*
U.S. Cl. 92—168 **9 Claims**

1. A fluid seal unit for use in retaining fluids within an associated sealed mechanism having first and second relatively movable parts defining at least one of a pair of fluid-receiving and retaining regions within said mechanism, said seal unit, and a first elastomeric seal body bonded to a portion of said casing unit, said first elastomeric seal body being of generally annular form, and having portions defining a primary fluid lip portion and a secondary excluder lip portion, with said primary lip portion having air and oil side frusto-conical surfaces meeting along a generally circular locus to define a seal band adapted to engage one of said first and second parts forming parts of said associated sealed mechanism in snug sealing engagement, said

oil side frusto-conical surface being directed in part toward the first of said pair of fluid-retaining sealed regions within said mechanism, and a second, relief valve seal body also bonded to said casing unit at and being defined at least in part by a generally radially outwardly facing annular surface, an at least partially radially inwardly facing surface and a radially extending end face surface joined at its edges to axially inner margins of said outwardly and inwardly facing annular surfaces, said relief valve seal body being adapted to cooperate with a contoured



relief valve seating surface forming a portion of said associated sealed mechanism, with said relief valve seal body surface and said seating surface being dimensioned so that said relief valve seal body surface is urged against said seating surface portion by the inherent resiliency of said relief valve seal body, said secondary excluder lip portion also including at least one annular surface adapted to define, in cooperation with one of said first and second movable parts of said sealed mechanism, a generally circular, radially inwardly acting excluder seal band.

4,508,021

VENTILATING ARRANGEMENT

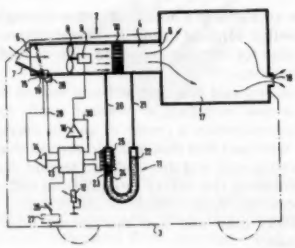
Helmut Steinmann, Höllhäuserweg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 503,722

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235162

Int. Cl.³ B60H *1/26*

U.S. Cl. 98—2.01 **7 Claims**



1. A ventilating arrangement, particularly an air conditioning arrangement for a vehicle having a cabin, comprising

an air passage extending from outside into a vehicle cabin;

an adjustable flow regulating flap associated with said air passage;

an impeller rotatable in said passage with a variable number of revolutions;

a flow resistance part provided in said air passage;

a nominal value setter for adjusting a nominal value of air throughput; and

a pressure measuring element arranged to act onto said flow regulating flap and to change the rotary speed of said impeller so that despite differing travel speeds an air throughput adjusted on said nominal value setter remains substantially the same, said pressure measuring element being formed as a differential pressure meter and having two connecting members arranged so that one of said connecting members is connected with said air passage upstream of said flow resistance part, whereas the other of said connecting members is connected with said air passage downstream of said flow resistance part.

4,508,022

CEILING AIR OUTLET

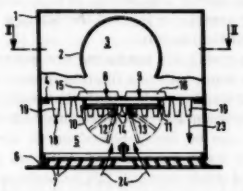
Wolfgang Finkelstein, Neukirchen-Vluyn, and Hans Riegel, Geldern, both of Fed. Rep. of Germany, assignors to Gebrueder Trox GmbH, Neukirchen-Vluyn, Fed. Rep. of Germany

Filed Nov. 24, 1982, Ser. No. 444,166

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147224

Int. Cl.³ F24F *13/075*

U.S. Cl. 98—40.12 **20 Claims**



1. A ceiling air outlet, in particular for air conditioned rooms, comprising:

(a) a housing;

(b) means associated with said housing for connecting said housing to a supply air duct;

(c) partition means mounted in said housing separating said housing into an upper housing and a lower housing and said means associated with said upper housing for thereto providing supply air;

(d) an outlet grid mounted to said housing parallel to and below said partition means and cooperating therewith for defining an induction space;

(e) at least a first outlet disposed in said partition means;

(f) adjustable baffle means connected to said partition means for adjustably opening and closing said at least a first outlet in response to fluctuations in the volume of supply air; and,

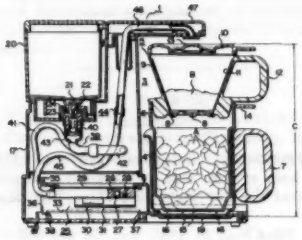
(g) a plurality of apertured nozzle means mounted to said partition means disposed about said at least a first outlet projecting into said induction space and communicating with said upper housing so that supply air issuing through said nozzle means creates a vacuum in said induction space causing areal air in the room to be drawn through said outlet grid into said induction space and therewith to mix with the supply air and to therewith issue through said outlet grid so that total amount of air issuing from said outlet grid into the room remains constant and whereby opening and closing of said baffle means in response to the volume fluctuations in supply air proportionately regulates the amount of areal air drawn into said induction space.

4,508,023

EXTRACT GENERATING DEVICE

Masaru Naya, Tama, and Tsuneichi Ikeda, Ibaraki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Kanazawa Industries, Asakusabashi, both of, Japan

Filed Jan. 31, 1984, Ser. No. 575,684
Claims priority, application Japan, Feb. 28, 1983, 58-32041
Int. Cl.[3] A47J *31/57*
U.S. Cl. 99—279 **10 Claims**



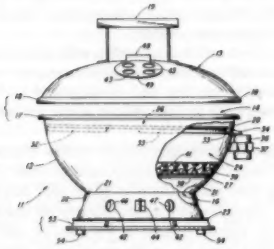
1. A device for producing an extract comprising:
a hot drink extractor including a jug and a filtering device;
a cooling vessel removably disposed between the jug and the filtering device and which is to be filled with ice, the cooling vessel, the jug and the filtering device forming a cold drink extractor;
hot water means for producing hot water and discharging the hot water into said filtering device; and
a movable stand, attached to the hot water means for movement between a first position in which the hot drink extractor can be freely placed on or removed from said movable stand and a second, retracted position in which said cold drink extractor can be positioned to receive hot water from hot water means, said movable stand including means for keeping the jug hot when said movable stand is in said first position.

4,508,024

INDOOR-OUTDOOR CONVERTIBLE COOKER

Gary M. Perkins, 3196 Boeing Rd., Cameron Park, Calif. 95682

Filed Apr. 9, 1984, Ser. No. 597,906
Int. Cl.[3] A47J *37/07*
U.S. Cl. 99—340 **10 Claims**



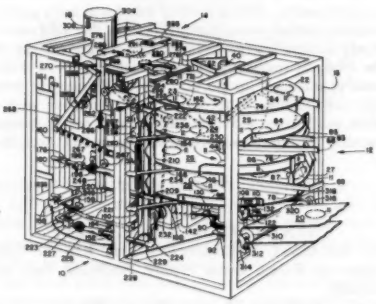
1. A convertible cooking apparatus, using a combustible material as a source of heat for outdoor cooking and a stove burner element as a source of heat adaptable for heating heat retentive material for indoor cooking, comprising:
a. a walled container defining a cooking chamber, said container having an open top defined by an upper edge and an open bottom defined by a lower edge, said lower edge being adapted to surround at least a portion of the stove burner element;
b. a cooking grill disposed within the upper portion of said cooking chamber;
c. a heating grate disposed within the lower portion of said cooking chamber, said heating grate being adapted to support the combustible material during outdoor cooking and to support a layer of heat retentive material during indoor cooking;
d. a removable top cover having a lower edge conforming to said upper edge of said container; and,
e. a removable base cover, attached to the lower edge of said container and enclosing said open bottom during outdoor cooking, said base cover being detached from said lower edge during indoor cooking.

4,508,025

TORTILLA PRESS AND OVEN UNIT

George A. Schultz, 176 Ohio Ave., New Braunfels, Tex. 78130

Filed Jun. 16, 1983, Ser. No. 504,871
Int. Cl.[3] A47J *37/00*
U.S. Cl. 99—353 **10 Claims**



1. An oven for toasting a bakery product, comprising:
a first disc rotatable in a horizontal plane through a complete revolution for toasting a first side of said bakery product thereon;
a second disc rotatable in a horizontal plane through a complete revolution adjacent to and in vertical alignment with said first disc for toasting a second side of said bakery product thereon;
means for rotating said first disc and said second disc, said rotating means including a vertical shaft extending through approximately a center of and in operative engagement with said first disc and said second disc;
means for heating said first disc and said second disc; and
means for translating said bakery product from said first disc to said second disc upon rotation of said first disc, thereby to sequentially toast said first and second sides of said bakery product.

4,508,026

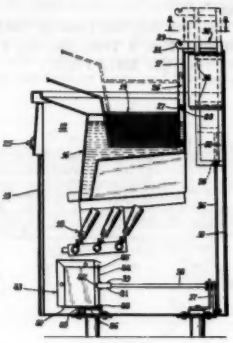
BASKET MOVING MECHANISM FOR DEEP FAT FRYER

Richard J. Anetsberger, and John A. Anetsberger, both of North Brook, Ill., assignors to Anetsberger Brothers, Inc., Northbrook, Ill.

Filed Jul. 25, 1983, Ser. No. 516,632
Int. Cl.[3] A47J *37/12*
U.S. Cl. 99—407 **5 Claims**

1. In a deep fat fryer having a kettle mounted in an outer casing, and food-supporting basket means for immersing food into, and removing the same from, said kettle; basket lowering and lifting means, comprising vertically slidable basket support means mounted at the rear of said casing, crank means rotatably mounted adjacent the lower end of said basket support

means for moving the latter vertically, shaft means secured to said crank means for rotating the same and extending forwardly therefrom, motor means mounted in the lower front



portion of said casing and connected to the forward end of said shaft means for rotating the same, and switch control means for said motor means mounted directly adjacent the latter.

4,508,027

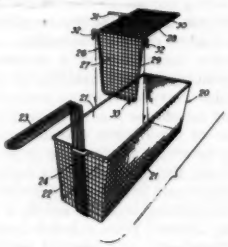
PORTION DIVIDING FRYING BASKET

Frederick B. McCord, 5121 Pinefield Dr., Macon, Ga. 31206

Filed Dec. 19, 1983, Ser. No. 563,081

Int. Cl.³ A47J *37/12*

U.S. Cl. 99—416 **15 Claims**



1. A partition unit for use with a food frying basket of the type having foraminous upstanding sides and ends, a foraminous bottom and open at its top, so that the partition separates premeasured individual food servings being cooked in the basket for retaining one serving in the basket while an adjacent cooked serving is being dumped from the basket, said partition unit comprising an L-shaped unit consisting of substantially right angular, rigidly connected panels formed of foraminous material, one of said panels being of dimensions to be removably received in said basket for extending between said sides, spaced from and generally parallel to the ends of said basket, the other of said panels being of dimensions to extend across a portion of said open top of said basket for arresting food in a part of said basket when the basket is inverted, a lifting handle fixed on the partition unit to facilitate placing it in cooperative relationship with a frying basket and means for removably connecting a perimeteral portion of one of said panels to the said basket for arresting such partition unit when the basket is inverted.

4,508,028

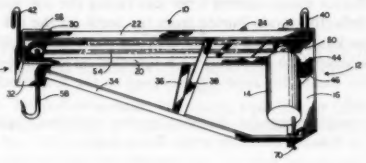
COOKING APPARATUS FOR VERTICALLY SUSPENDING AND ROTATING MEAT

James D. Booker, Jr., P.O. Box 355, Marksville, La. 71351

Filed Nov. 14, 1983, Ser. No. 551,328

Int. Cl.³ A47J *37/04*

U.S. Cl. 99—421 V **15 Claims**



1. A portable cooking apparatus for suspending and rotating food in close proximity to a heat source, comprising:

a. portable frame means adapted to be suspended from an elongated horizontal support member, said portable frame means having a first end plate and a second end plate, said first end plate and said second end plate being parallel;

b. hook means for suspending food to be cooked, said hook means being rotatably connected to said frame means, said hook means being rotatable about a vertical axis;

c. electric motor means rigidly connected to said frame means for rotating said hook means, said motor means being located on said frame means at a distance from said hook means and said heat source sufficient to prevent damage to said electric motor means from said heat source, said electric motor means being connected to said first end plate, and

d. drive means for connecting said electric motor means to said hook means for causing said hook means to rotate.

4,508,029

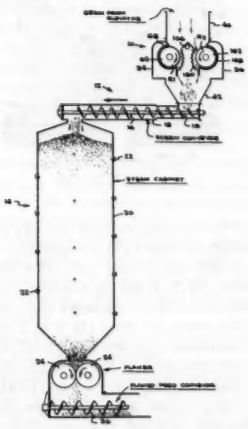
APPARATUS FOR PREPARING FEED GRAIN

Thomas J. Malone, Lubbock, Tex., assignor to Nutri-Developers, Inc., Lubbock, Tex.

Filed May 3, 1983, Ser. No. 491,856

Int. Cl.³ B02B *1/00*; B02C *4/00*

U.S. Cl. 99—516 **55 Claims**



1. Apparatus for treating grain comprising:

a steam flaker having an inlet;

grain scratcher-moisturizer including housing;

roll means of cylindrical configuration mounted for rotation in said housing;

drive means for drivingly rotating said roll means;

a plurality of teeth extending in a general radial direction from said roll means;

feed means for directing grain onto said roll means when said roll means is being driven so that one or more of said teeth strike and scratch the surface of the grain and hurl it away from the roll means;

deflector means spaced from and facing the roll means for deflecting grain hurled from the teeth on the roll means back into striking contact with the teeth on the roll means whereby the grain surface is scarified on its outer surface;

spray means for applying moisture to the scratched grain; and

discharge means for discharging the scratched grain from the housing into said steam flaker inlet.

4,508,030

METAL BINDING WIRE TWISTING DEVICE

René Grenon, Victor Hugo St., 21, 77181 Courtry, France

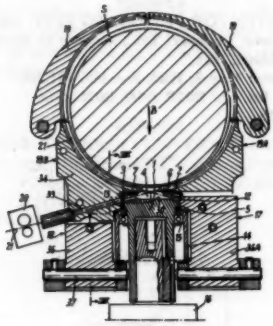
PCT No. PCT/FR82/00057, § 371 Date Nov. 3, 1982, § 102(e) Date Nov. 3, 1982, PCT Pub. No. WO82/03368, PCT Pub. Date Oct. 14, 1982

PCT Filed Mar. 23, 1982, Ser. No. 441,534

Claims priority, application France, Mar. 26, 1981, 81 06106

Int. Cl.³ B65B *13/28*

U.S. Cl. 100—26 **12 Claims**



1. A device for twisting together the two ends (23,24) of a wire (21) binding an object (S) comprising a wire guide (19) with a groove (35) and a fixed part (19A,19B) containing a rotatable twisting head (1) having a central recess (4) with two oppositely-disposed inclined passages (2,3) and aligned with the groove (35) when the head (1) is in a stopped position, wherein two oppositely disposed clamps (17,18) are adapted to immobilize respective ends of the wire (21) in the wire guide (19) close to the head (1), said clamps (17,18) each gripping said wire (21) between the head (1) and the object (S), and the oppositely-disposed inclined passages (2,3) are cylindrical passages opening in a lateral surface of the head, an abutment member (12) is disposed opposite the external opening of one passage (2) and cutting means (13) are disposed in correspondence with an external opening of the opposite passage (3) to cooperate with said external opening for cutting the wire.

4,508,031

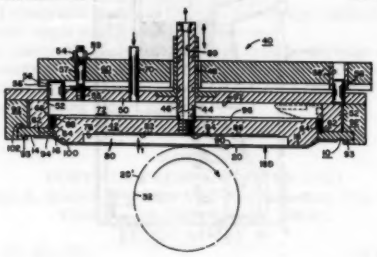
FLEXIBLE MEMBRANE PRINTING APPARATUS FOR A DECORATING MACHINE

Lawrence S. Rajnik, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 332,723, Dec. 21, 1981, abandoned. This application Feb. 8, 1984, Ser. No. 578,049

Int. Cl.³ B41F *17/00*

U.S. Cl. 101—41 **18 Claims**



1. Apparatus for printing an article utilizing a design carrying working surface comprising:

a frame having an aperture therein, a flexible elastic membrane carried by said frame, said flexible membrane having a working surface forming a portion of said membrane and disposed over said aperture;

means for supporting the flexible working surface of the membrane for application of a separable design thereon including a housing, and a porous plate mounted within said housing having a free face for engaging an opposed rearward facing portion of said flexible working surface; and means coupled to said housing for supplying reduced air pressure relative to atmospheric pressure for establishing a reduced air pressure relative to ambient atmosphere at the free face of said porous plate, and for drawing said rearward facing portion of the flexible working surface against said free face of the porous plate to secure said membrane in close contact therewith;

flexible actuator means having a deformable solid preshaped face engagable with said flexible membrane opposite the design carrying working surface thereof for deforming said membrane into conformance with said preshaped face of the flexible actuator means; means for positioning the article adjacent the deformed membrane;

means for driving the actuator means and for moving said deformed membrane having the shape of said pre-shaped face into engagement with the article in a nonslip simulated rolling contact, from a center area thereof to an outer peripheral edge, at a selected contact angle of between 5° and 50°, for separating the design portion from the membrane and transferring the same to the article; and said membrane having a selected affinity for the design portion less than that of the article so that upon contact with said article the design portion transfers to the article.

4,508,032

GRAVURE PRESS

Wilfred Philipp, Lenbach Strasse 8, D 7014 Kornwestheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 122,996, Feb. 20, 1980, abandoned. This application Jun. 30, 1982, Ser. No. 393,778

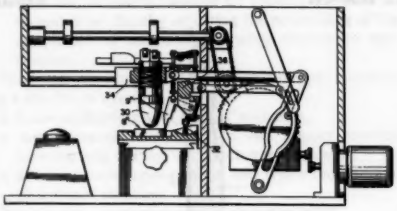
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 2906902; Apr. 12, 1979, 2914878

Int. Cl.³ B41F *1/16*; B41M *1/40*

U.S. Cl. 101—163 **7 Claims**

1. A gravure press for use in indirect gravure printing having a gravure plate seated on a mounting plate, an inking device for applying ink to the plate, a doctor blade for wiping the inked plate, a silicon rubber pad for transferring the ink to the mate-

rial to be printed, and a drive mechanism for the silicon rubber pad, the inking device and the doctor blade, said drive mechanism being provided with a dovetailed groove having threaded guide sections, said guide sections containing a screw on which are mounted a flanged sleeve and a disk, said mounting plate being level and having a micro-finished smooth flat surface, said gravure plate comprising a thin sheet of uniform thickness coated with a light sensitive plastic containing a design in the form of washed out dots or lines, and having a thickness equal



to the depths of said washed out dots or lines, said doctor blade being rigid, resistant to bending and having a straight-edge for wiping said gravure plate, and means mounting said doctor blade on said drive mechanism for securing and maintaining the straight edge of said doctor blade parallel to the flat surface of said gravure plate on contact of said doctor blade therewith, said means mounting the rigid doctor blade comprising a resilient support pad being held on and between said sleeve and said disk, the edge of said doctor blade opposite said straigth edge being seated in said support pad.

4,508,033

TRAVELING PAPER WEB CAPTURING APPARATUS FOR USE WITH A ROTARY PRINTING MACHINE

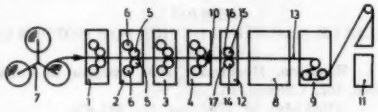
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,661

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309558

Int. Cl.[3] **B65H** *25/00;* **B41F** *13/54*

U.S. Cl. 101—217 **4 Claims**



1. In a rotary printing machine system having at least one printing station (**1, 2, 3, 4**), each including at least one rotary printing cylinder (**5**) and a counter cylinder, for printing subject matter on a side of a substrate web;

apparatus to prevent damage to the printing cylinder or the counter cylinder, respectively, upon tearing of the web, located downstream—in the direction of travel of the web—of at least one printing station, having

two paper capturing cylinders or rollers (**14, 15**) located at opposite sides of the web (**13**),

wherein

the paper capturing cylinders or rollers (**14, 15**) are in a continuous resilient engagement, with the web (**13**) interposed therebetween both during normal printing by the at least one printing system as well as upon tearing of the web;

both rollers (**14, 15**) are driven with a circumferential speed which is at least approximately equal to the linear speed of the web;

at least that one of the capturing cylinder or roller which faces the printed subject matter has the same diameter as the printing cylinder;

and wherein that one of the capturing cylinder or roller which is in engagement with the side of the web which has received printed information at the at least one printing station has a surface which is ink-and-printed-information-accepting.

4,508,034

CONTROL MECHANISM TO DISABLE DRIVEN INK METERING ELEMENTS IN ROTARY PRINTING MACHINES

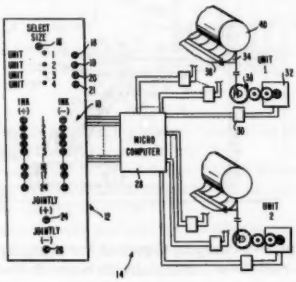
Claus A. Bolza-Schünemann, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany

Continuation of Ser. No. 300,854, Sep. 10, 1981, abandoned. This application Feb. 2, 1984, Ser. No. 575,726

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3034417

Int. Cl.[3] **B41F** *31/30*

U.S. Cl. 101—365 **7 Claims**



1. In a control mechanism for disabling selected driven ink metering elements in rotary printing machines from a remote control station, which metering elements cooperate with an ink fountain roller, comprising:

at least one ink fountain roller having an ink fountain;

a plurality of ink metering elements for said ink fountain, said ink metering elements being individually adjustable to control the flow of ink from said fountain to said roller;

a plurality of drive motors, each drive motor being connected to drive an individual corresponding ink metering element in response to a motor control command signal;

a program-controllable micro computer having control inputs and output means providing command output signals;

a remote control panel having selectable command control means including a "Reduce Ink" command push button and an "Increase Ink" command push button for each ink metering element, an "Inking Unit" command push button for each ink fountain roller in the rotary printing machine for selecting an inking unit to be controlled, a "Select Size" command push button, a "Jointly-Reduce Ink" command push button, and a "Jointly-Increase Ink" command push button;

means connecting said push buttons to corresponding control inputs to said micro computer;

means connecting said output means of said micro computer to corresponding drive motors, to provide selectable motor control command signals to said drive motors, said micro computer being operable selectively to position individual metering elements in response to operation of corresponding push buttons, whereby after operating said "Select Size" push button and a selected "Inking Unit" push button and subsequently operating a "Reduce Ink" push button for at least one selected adjustable metering

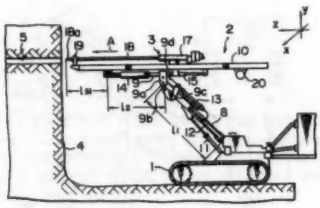
element, all selected metering elements are adjusted to a zero gap position with respect to their corresponding ink fountain roller, wherein ink metering elements adjusted into a zero position are placed in an inactive status with respect to any subsequent operation of said "Increase Ink", "Reduce Ink", "Jointly-Increase Ink", and "Jointly-Reduce Ink" push buttons, unless said inactive status is released by subsequent operation of said "Select Size" push button.

4,508,035

EXPLOSIVE CHARGING APPARATUS FOR ROCK DRILLING

Tohru Mashimo, and Osamu Satoh, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 18, 1983, Ser. No. 467,837
Claims priority, application Japan, Feb. 19, 1982, 57-26461
Int. Cl.³ F42B *3/00*
U.S. Cl. 102—313 **7 Claims**



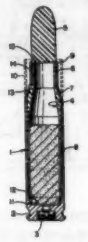
1. An explosive charging apparatus for charging controlled amount of explosives sequentially to bores drilled in a rock surface, said charging apparatus including explosive charging means having explosive outlet means, boom means carrying said explosive outlet means of the explosive charging means, boom actuating means for actuating said boom means so that the explosive outlet means of the explosive charging means is moved to a desired position, control circuit means for controlling said boom actuating means and said explosive charging means, said control circuit means including memory means having memories concerning locations, directions and depths of bores drilled in a rock surface, means for addressing memories of one of the bores in said memory means, transducing means for converting the addressed memories in said memory means to values of movements of said boom actuating means, servo control means for receiving outputs from said transducing means and controlling operations of said boom actuating means to locate said explosive outlet means against one of the bores drilled in the rock surface, charge depth setting means for setting a desired depth of explosive charging, charge control means operable upon completion of operation of said servo control means for controlling said explosive charging means so that explosives are charged to the desired depth in accordance with outputs of said charge depth setting means and applying a signal to said addressing means upon completion of explosive charging operation so that memories on another bore are addressed to perform another cycle of operation, said memory means including memories of bottom positions of the bores as the memories concerning the depths of the bores, the charge depth setting means including bore depth operation means for performing operations based on the memories in the memory means to obtain actual bore depths, void depth setting means for setting lengths in the bores where the explosives are not to be charged and charge depth operation means for performing operations based on actual bore depth signals from the bore depth operation means and void depth signals from the void depth setting means to determine charge depths.

4,508,036

TRAINING CARTRIDGE WITH SYNTHETIC RESIN PROJECTILE OR DUMMY PROJECTILE

Ernst Jensen; Jürgen Knappworst, and Rudolf Stahlmann, all of Fürth, Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 17, 1983, Ser. No. 542,585
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238268
Int. Cl.³ F42B *00/00*
U.S. Cl. 102—444 **6 Claims**



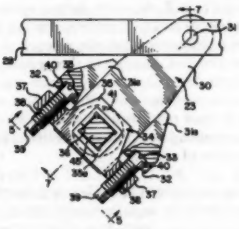
1. A training cartridge equipped with a synthetic resin projectile comprising a cylindrical cartridge case made of metal which is open at a front end and closed at a bottom end and a synthetic resin solid projectile integrally formed on a synthetic resin sleeve open at its rear end; said sleeve being inserted in the cartridge case and being held therein by means of a frontal zone of the cartridge case; said frontal zone comprising a conical case shoulder and an at least substantially cylindrical case neck that has an opening formed at the open front end of the cartridge case, the cartridge case being extended in the forward direction up to and flush with a rear end of the solid projectile and, after insertion of the synthetic resin sleeve, being drawn inwards in the frontal zone to form said conical case shoulder and said at least substantially cylindrical case neck, whereby the shoulder and neck encompass the synthetic resin sleeve in close contact therewith and clean separation of the solid projectile takes place at the open front end of the cartridge case upon firing of the cartridge.

4,508,037

DOOR LEVER ADJUSTING DEVICE FOR HOPPER CAR DOORS

George L. Rousseau, Homosassa, Fla., assignor to Pullman Standard, Inc., Chicago, Ill.

Filed May 24, 1982, Ser. No. 381,476
Int. Cl.³ B61D *7/18, 7/26, 7/28*
U.S. Cl. 105—290 **25 Claims**



1. A railway hopper car including a hopper structure having a discharge opening,

a frame supporting said hopper structure,

a door assembly connected to said hopper structure for opening and closing discharge opening,

a door operator supported on said frame including a movable thrust member,

lever means connected to said thrust member,

an actuating member projecting from the end of said lever means and being adjustably rotatable in the end of said lever means into a plurality of locked adjusted positions,

linkage means connected to said actuating member and said door assembly for closing and opening the same during rotation of said lever means, and

adjusting means engageable with said lever, and associated with said actuating member for rotating the same relative to said lever thereby adjusting the positioning of the linkage means of said door assembly relative to said door operator.

16. A railway hopper car including a hopper structure having a discharge opening,

a frame supporting said hopper structure,

a door assembly connected to said hopper structure for opening and closing said discharge opening,

a door operator supported on said frame including a movable thrust member,

lever means connected to said thrust member,

an actuating member projecting from said lever means,

linkage means connected to said actuating member and said door assembly for closing and opening the same during rotation of said lever means, and

adjusting means engaging said lever and being associated with said actuating member for rotating the actuating member relative to said lever in the assembled condition of said lever means with said actuating member, thereby adjusting the position of the linkage means of said door assembly relative to said door operator.

4,508,038

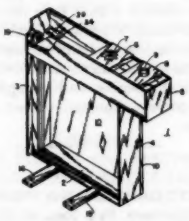
COLLAPSIBLE END TABLE

William Tulenko, Jr., 8530 Wittner Rd., Pittsburgh, Pa. 15237

Filed Jun. 21, 1983, Ser. No. 506,507

Int. Cl.³ A47B *3/00*

U.S. Cl. 108—135 **4 Claims**



1. A free standing collapsible table unit which is completely separate from and useful alongside any sofa or chair, said unit comprising a vertically mounted solid table that has opposite edges which are relatively slidable inwardly or outwardly of said unit, a pivot extendible outwardly of the upper edge of said table, a supporting panel into the edge of which said pivot extends, a knob attached to said supporting panel, so that by pulling the knob laterally of said unit, the table may be selectively slid inwardly or outwardly of said unit along said edges, a leg of said table which is pivotally mounted at one end of the table edge, means for temporarily holding said leg in place along the edge of said table, located at the other end of said table edge when said table is collapsed, whereby said table when pushed outwardly of said unit, may be selectively swung on said pivot into a horizontal plane so as to extend horizontally outwardly of said unit, either from the front of the unit or from the rear of the unit while supported on said leg when the leg is pivotally swung to the vertical position, and means for detachably fastening said unit to the underframe of a sofa or chair and constituting the sole means for attaching said unit thereto.

4,508,039

METHOD OF AND SYSTEM FOR INCINERATING SLUDGE

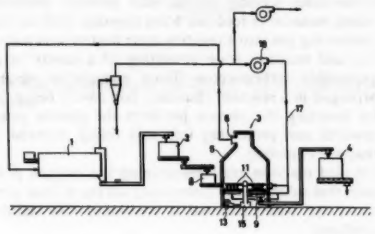
Tetsuo Noguchi, and Kanji Kuwabara, both of Shizuoka, Japan, assignors to Kabushiki Kaisha Okawara Seisakusho, Shizuoka, Japan

Filed Apr. 16, 1984, Ser. No. 600,470

Claims priority, application Japan, Apr. 22, 1983, 58-71645

Int. Cl.³ F23G *5/00*

U.S. Cl. 110—258 **5 Claims**



1. A method of incinerating sludge, comprising the steps of:

(a) predrying the sludge in a dryer;

(b) introducing the predried sludge into an incinerator;

(c) stirring the introduced sludge in the incinerator by at least one stirring arm; and

(d) concurrently with said stirring, blowing an amount of air, ranging from a half to one times as much as a theoretical amount of air needed for combustion of the sludge, from said stirring arm to the sludge to burn the latter gently, and

(e) further blowing an exhaust gas of high humidity and low oxygen concentration to the sludge in the incinerator for being mixed with a reducible exhaust gas, which is produced during an initial combustion in the incinerator, to thereby burn the sludge at a temperature below 1,200° C.

4,508,040

METHOD AND PLANT FOR CONVERSION OF WASTE MATERIAL TO STABLE FINAL PRODUCTS

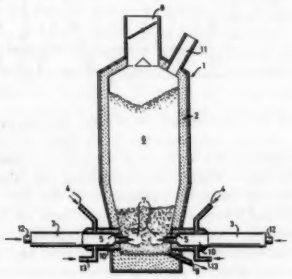
Sven Santén, and Jan Thörnblom, both of Hofors, Sweden, assignors to SKF Steel Engineering Aktiebolag, Sweden

Filed Aug. 2, 1982, Ser. No. 404,404

Claims priority, application Sweden, Jan. 18, 1982, 8200228

Int. Cl.³ F23D *1/00*; C07C *31/04*

U.S. Cl. 110—347 **16 Claims**



1. A method of converting waste material at least partially

comprising thermally disintegratable chemical substances to stable final products such as CO_2, H_2O and HCl, comprising the steps of:

(a) bringing such waste material as may be present in solid form into feedable form by dissolving, suspending or crushing such material;

(b) at least partially disintegrating the waste material in a plasma gas of high temperature generated in a plasma generator by introducing the plasma gas, with at least one of the waste materials and the disintegration products thereof, into a prereaction chamber between the plasma generator and a reaction chamber, and subjecting said plasma gas and said at least one of said waste material and disintegration products to intense turbulence therein;

(c) thereafter feeding the at least partially disintegrated waste material in feedable form together with an oxygen-containing gas into a reaction zone heated to at least 2000° C., said reaction zone consisting of a cavity in a gas-permeable carbonaceous filling material in piece form arranged in a reaction chamber, said cavity being formed by directing the plasma jet from the plasma generator towards and projecting into said filling material in the reaction chamber;

(d) in said reaction zone maintaining the oxygen potential such that substantially completely all the at least partially converted waste material is converted into stable final products;

(e) removing the stable final products from the reaction zone by permitting gaseous products to flow upwardly through the gas-permeable filling material and molten or soild products to fall into the bottom of the reaction chamber; and

(f) binding substantially all of such chlorine and hydrogen chloride as may be contained in said gaseous products by rapid cooling and washing.

4,508,041

PROCESS FOR THE COMBUSTION OF COKE PRESENT ON SOLID PARTICLES AND FOR THE PRODUCTION OF RECOVERABLE HEAT FROM HYDROCARBON-BEARING SOLID PARTICLES AND APPARATUS THEREFOR

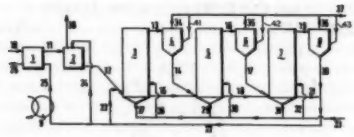
Heinz Voetter; Richard C. Darton; Hubrecht C. A. Van Meurs, and Rajamani Krishna, all of The Hague, Netherlands, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Sep. 8, 1983, Ser. No. 530,442

Claims priority, application United Kingdom, Oct. 21, 1982, 8230131

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 **26 Claims**



1. Process for the combustion of coke present on solid particles from which hydrocarbons have been substantially removed by heating, in a series of at least two combustion stages under entrainment conditions, comprising the following steps:

(a) feeding all the solid particles into the first combustion stage of the series, through an inlet near its bottom;

(b) introducing an oxygen-containing gas into the bottom of each combustion stage, whereby at least part of the particles are entrained towards an upper outlet and at least part of the coke on the particles is combusted, yielding a flue gas;

(c) passing the particles and the flue gas from the upper outlet of each combustion stage into a separation stage, following each combustion stage;

(d) separating the flue gas from the particles in each separation stage, discharging the flue gas at the top of the said stage and withdrawing the particles at the bottom thereof; and

(e) introducing at least a part of the witndrawn particles into the next combustion stage subsequent to the separation stage through an inlet near its bottom, thereby starting a new sequence essentially the same as in (a) through (d), at least a part of the particles withdrawn from the last separation stage being discharged.

4,508,042

NEEDLE CLAMP FOR A SEWING MACHINE

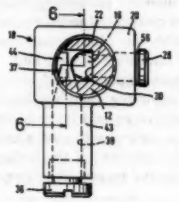
Nereo Bianchi, Pavia, Italy, assignor to NECCHI Societa per Azioni, Pavia, Italy

Filed Jul. 1, 1982, Ser. No. 393,887

Claims priority, application Italy, Jul. 13, 1981, 42913 A/81

Int. Cl.³ D05B *55/02*

U.S. Cl. 112—226 **1 Claim**



1. A needle clamp for a sewing machine for fastening the shank portion of a needle in a predetermined position to a bottom portion of a needle bar, a separate guide member attached to a lower portion of said needle clamp and including a top surface with a cylindrical opening through which passes a grooved bottom portion of said needle bar, said guide member having a bottom surface with a hole therein through which passes said needle shank to lie within said needle bar groove, wherein said hole has substantially the same shape as a transverse section of the needle shank, and a tooth means extending into said cylindrical opening and engaging said needle bar groove to ensure correct alignment of said guide member with said needle clamp.

4,508,043

PRESSER FOOT DEVICE ON A SEWING MACHINE

Kurt Vollmar, Weilerbach, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Nov. 9, 1983, Ser. No. 550,194

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1982, 3242509

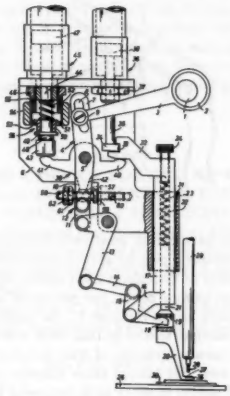
Int. Cl.³ D05B *29/02*

U.S. Cl. 112—235 **8 Claims**

1. A presser foot device on a sewing machine having a reciprocating presser foot, an oscillating drive for said presser foot which includes a toggle mechanism having an output member connected to the presser foot for moving it downwardly and upwardly to engage and disengage from the material to be sewn and which is connected to the presser foot for effecting vertical oscillations synchronously with the stitch formation, and wherein the presser foot is movable by a first compressed air cylinder and piston combination between an inoperative and an operative position, comprising a second air cylinder and piston combination adjacent the presser foot, a movable abutment element carried on said machine which is engaged by said second compressed air cylinder and piston combination for adjusting the lowered position of the foot, said

abutment element comprising a lever engaged with the piston rods of said first and second piston and cylinder combinations which is pivotally mounted and acts on said presser foot for varying the height postion of the output element of the oscillating drive, said second compressed air cylinder and piston combination comprising an double-action cylinder, and spring means holding said piston of said second piston and cylinder combination in intermediate position when said second cylinder is vented.

4. In a sewing machine which includes a reciprocating needle adapted to move into and out of engagement with a work-



piece and which includes a presser foot which reciprocates outwardly into and out of engagement with the workpiece to be sewn and a drive member which is oscillated by the sewing machine drive which is connected through an angle lever of a toggle mechanism to the presser foot for moving it, the improvement comprising a control member movably mounted adjaceent said presser foot and engageable with said presser foot and being movable to shift said presser foot to adjust the lower dead center position of said presser foot and to move the presser foot between an operative and inoperative position, and fluid pressure means acting on said control member for varying the position thereof.

4,508,044

REBUILT PILLOW AND METHOD OF MANUFACTURING THE SAME

Robert E. Downey, and Claudine K. Downey, both of 1902 E. Fir St., Mt. Vernon, Wash.

Filed Jun. 14, 1983, Ser. No. 504,068
Int. Cl.[3] **D05B** *97/00*
U.S. Cl. 112—262.2 **17 Claims**

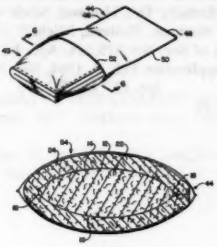
1. A method of making a rebuilt pillow, said method comprising:

(a) providing an existing pillow comprising a tick and a stuffing enclosed within said tick, said stuffing having sufficient bulk to occupy a substantial portion of an interior area of said tick, but which provides less than adequate cushioning support;

(b) providing an envelope having an overall configuration and overall dimensions corresponding to said existing pillow, said envelope defining a cavity to receive said existing pillow, said envelope being made of a yielding, cushioning material having a wall thickness sufficient to mask irregularities in the stuffing of the existing pillow;

(c) inserting the existing pillow into the cavity of said envelope;

(d) providing a second tick having an opening and inserting into the second tick the envelope with the existing pillow therein;



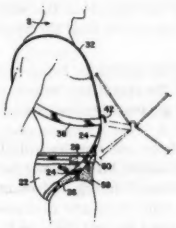
(e) closing the opening of the second tick to form said rebuilt pillow.

4,508,045

SAILBOARD HARNESS

Barry Spanier, Paia, Hi., assignor to Maui Harness Corporation, Kahului, Hi.

Filed Jan. 11, 1983, Ser. No. 457,193
Int. Cl.[3] **B63B** *35/72;* **B63H** *9/10*
U.S. Cl. 114—39 **12 Claims**



1. A sailing harness adapted to be worn by a sailor and fastened to the sail assembly of a sailboard for supporting the sailor during sailing and reducing fatigue, comprising:

buttock-engaging means adapted to surround the sailor's buttocks, including a projecting flexible load-bearing portion which is movable between an unloaded position close to the sailor's torso and a loaded position extending upwardly and forwardly of the sailor's hips;

a coupling member connected to said load-bearing portion and adapted to be fastened to the sail assembly, said coupling member movable between an unloaded position close to the sailor's torso and a loaded position forwardly of the sailor's hips; and

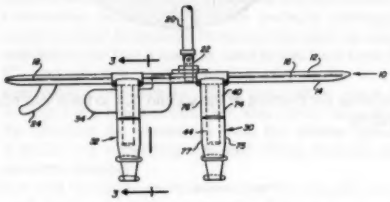
elastic retaining means adapted to be fastened to the upper torso of the sailor for keeping said coupling member close to the sailor's torso when no load is applied to said coupling member, and stretching to permit said coupling member to move away from the sailor's torso when load is applied to said coupling member, without transmitting substantially any of said load to the sailor's upper torso, whereby substantially all of the load transmitted through said coupling member is transferred through saidbuttock-engaging means to the sailor's hips.

4,508,046

WIND SURFING HYDROFOIL APPARATUS

James C. Coulter, Birmingham, Mich., and Michael P. Shannon, 2609 N. Lakeshore Dr., Holland, Mich. 49423, assignors to Michael P. Shannon, Holland, Mich.

Continuation of Ser. No. 895,114, Apr. 10, 1978, abandoned.
This application Feb. 8, 1984, Ser. No. 578,170
Int. Cl.³ B63B 1/26
U.S. Cl. 114—39 77 Claims



1. Wind surfing hydrofoil apparatus for enabling hydroplaning of a wind surfing board having a mast mounted centrally thereon between a front end portion and a rear end portion of the board, and comprising:

a front hydrofoil means for being mounted below the bottom surface of the board on the side edges of the board in juxtaposition to the mast for hydroplaning support of the board;

a rear hydrofoil means for being mounted below the bottom surface of the board on the side edges of the board rearwardly of the mast for hydroplaning support of the board; and

each of the front and rear hydrofoil means comprises:

a pair of inclined lift-out wing members of surface piercing and board lifting cross-sectional configuration extending outwardly and downwardly from and relative to the board beyond the side surfaces of the board;

a pair of inclined flying wing members of surface piercing and board lifting cross-sectional configuration extending downwardly and inwardly relative to and from the lift-out wing members with outermost uppermost portions located outwardly beyond the side surfaces of the board and with innermost lowermost portions located inwardly beyond the side surfaces and below the bottom surface of the board;

each flying wing member having an upper elongated portion of uniform cross-sectional size approximately equal to the cross-sectional size of said lift-out wing members and a lower elongated tapered portion of uniformly downwardly inwardly varying cross-sectional size terminating in a lower end portion of lesser cross-sectional size than said upper elongated portion;

a generally vertically extending support strut member fixedly mounted inboard of each of said pair of flying wing members and each of the associated ones of said pair of lift-out wing members and having a lower end portion thereof fixedly supportively connected to each of the associated ones of said flying wing members and having an upper end portion thereof fixedly supportively associated with the board; and

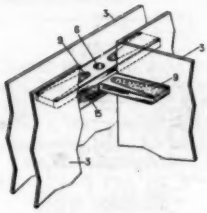
mounting means for rigid attachment of the hydrofoil means to the side edge surfaces of the board.

4,508,047

CONNECTIONS BETWEEN DIVIDING WALLS, PARTICULARLY FOR THE CONSTRUCTION OF BOAT HULLS

Andre J. E. Bordat, Rueil Malmaison, France, assignor to Constructions Mecaniques de Normandie, Paris, France

Filed Apr. 19, 1983, Ser. No. 486,596
Claims priority, application France, Apr. 21, 1982, 82 06875
Int. Cl.³ B63B 3/00, 3/48, 3/56, 5/24
U.S. Cl. 114—355 11 Claims



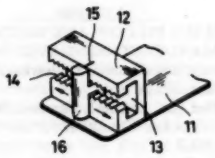
1. A connection between at least two dividing walls whose mean surfaces intersect along an axis L, said connection being formed by a plurality of fastenings each extending radially in at least one direction from a pivot, the pivots of said fastenings being stacked axially along the axis L, the contiguous fastenings of the stack being oriented so that they extend alternately parallelly to the mean surfaces of the dividing walls, each fastening having two flat lateral faces parallel to each other and to axis L, said lateral faces of each fastening being covered with fabric ribbon having threads extending perpendicularly to axis L and each dividing wall being limited by two sheets parallel to each other and to axis L and bonded to the ribbons covering the corresponding fastenings.

4,508,048

POINTER MECHANISM

Hideo Wada, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,730
Claims priority, application Japan, Aug. 31, 1981, 56-128788[U]
Int. Cl.³ H03J 1/04, 1/02
U.S. Cl. 116—291 1 Claim



1. A pointer mechanism for a tuner which comprises:

an elongated pointer board mounted for lateral movement relative to said tuner in response to a tuning manipulation, said pointer board having an edge portion at one longitudinal end thereof;

an elongated pointer mounting member fixedly mounted on said edge portion of said pointer board and extending laterally thereon, said pointer mounting member having an elongated groove of substantially T-shaped cross section extending laterally therein, said T-shaped groove defining an opening through the outer surface of said pointer mounting member, said opening being narrower than the remainder of said groove, said pointer mounting member having opposed spaced-apart walls defining the opposite sides of the stem of said T-shaped groove, both of

said walls being serrated to define a lengthwise row of indentations extending along said walls; and

a pointer member having a pointer disposed in front of the outer surface of said pointer mounting member and having a substantially T-shaped fitting portion extending rearwardly therefrom and extending into and substantially filling the T-shaped cross section of said groove whereby said fitting portion is engaged within said groove so as to prevent removal of said pointer member from said pointer mounting member by outward movement of said pointer member relative to said pointer mounting member, said fitting portion having oppositely projecting protrusions on opposite sides of the stem of said fitting portion, which protrusions are in releasable, resilient engagement with indentations on said walls, whereby said pointer member is releasably fixed to said pointer mounting member and can be moved laterally along said fitting groove to adjust the position thereof.

4,508,049

METHOD AND A DEVICE FOR THE PRODUCTION OF ELECTRICAL COMPONENTS, IN PARTICULAR LAMINATED CAPACITORS

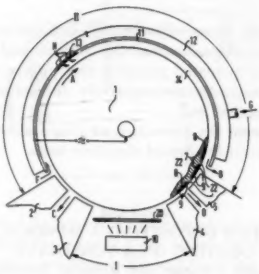
Reinhard Behn; Hermann Heywang, both of Munich, and Horst Pachonik, Unterhaching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 22, 1979, Ser. No. 87,413

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847602

Int. Cl.³ B05D *3/06*

U.S. Cl. 118—50.1 **6 Claims**



1. Apparatus for producing electrical components which have at least one metal coating and at least one polymer coating carried one on top of another on a carrier, comprising:

a rotatable drum including a peripheral surface and a plurality of recesses in said surface;

retaining means for retaining a plurality of carriers in said recesses;

said drum adapted for connection to one pole of an a.c. voltage source;

a counter electrode spaced from and extending about a first portion of said drum defining a polymerization chamber, said counterelectrode adapted for connection to another pole of the a.c. voltage source and including first supply means communicating with the space between said counterelectrode and said drum for attachment to a monomer gas supply, said polymerization chamber operable to apply a polymer coating on the electrical component structure traveling therethrough;

first and second air-locks at respective circumferential ends of said counterelectrode, each of said air-locks including a port communicating with said polymerization chamber for the evacuation of residual monomer gas;

a metallization chamber extending circumferentially about a portion of said drum between said first and second air-locks; and

metallization means in said metallization chamber for applying a metal coating to the electrical component structure traveling therethrough.

4,508,050

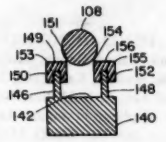
DOCTOR APPARATUS FOR COATING MACHINE

Frederick R. Tittmann, 1075 Oakland Ave., Plainfield, N.J. 07060

Filed Dec. 22, 1983, Ser. No. 564,382

Int. Cl.³ B05C *11/02*

U.S. Cl. 118—118 **9 Claims**



1. Doctor apparatus for use in a coating machine comprising

a support base for a doctor rod,

a pair of spaced-apart support members removably secured to said support base and having portions providing two horizontal support surfaces,

said support surfaces having facing edges, and

a doctor rod seated on the facing edges of said support surfaces provided by said spaced-apart support members,

said support members being throwaway strips of simple construction and of a synthetic resinous material.

4,508,051

APPARATUS FOR APPLYING VISCOUS SUBSTANCES PARTICULARLY ADHESIVES

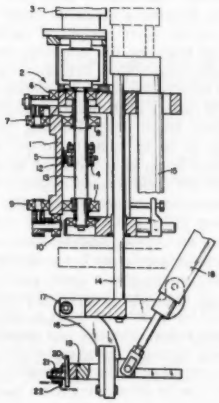
Wilhelm Bast, Mucke-Nieder-Ohmen, Fed. Rep. of Germany, assignor to Faust-Fertigungstechnik GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,979

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1981, 3141112

Int. Cl.³ B05C *5/02*

U.S. Cl. 118—410 **5 Claims**



1. Apparatus for applying viscous substances, for example adhesives, to the frame flanges of window openings in motor

vehicles, said apparatus comprising an all-round rail shaped in accordance with a window opening to the frame of which said viscous substances are to be applied, a carriage displaceably arranged on said rail, and a discharge nozzle and a scanning unit mounted on said carriage, said scanning unit being engageable with the frame flange of said window opening to follow the same and having limited mobility with respect to said carriage, wherein the discharge nozzle is held by a bracket arm which is outwardly pivotable with respect to the all-round rail, said bracket arm is mounted on a guide column displaceable at right angles with respect to the plane of said rail and held by said carriage, and said scanning unit comprises a scanning wheel mounted on said bracket arm for scanning the window opening contour.

4,508,052

DEVELOPING DEVICE

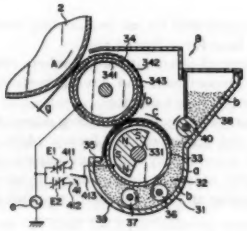
Mitsuaki Kohyama, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 9, 1983, Ser. No. 521,642

Claims priority, application Japan, Aug. 16, 1982, 57-141940

Int. Cl.³ G03G *15/06*

U.S. Cl. 118—651 **8 Claims**



1. A developing device adapted to develop an electrostatic latent image on an electrostatic latent image-forming surface of an image carrier by jumping a nonmagnetic toner onto the image-forming surface, comprising:

a casing containing a mixture of the nonmagnetic toner and a magnetic carrier;

a hollow cylindrical body formed of a nonmagnetic material and rotatable in a position such that part of the hollow cylindrical body is buried in said mixture in said casing;

magnet means, contained within said hollow cylindrical body, for forming a magnetic brush comprised of said mixture on an outer peripheral surface of said hollow cylindrical body by the magnetic force of the magnet means when said hollow cylindrical body is rotated;

a rotatable developing roller positioned between said outer peripheral surface of the hollow cylindrical body and said electrostatic latent image-forming surface of the image carrier so as to be adjacent to but separated from the electrostatic latent image-forming surface and so as to be in contact with said formed magnetic brush; and

voltage impressing means, electrically connected to the developing roller and the hollow cylindrical body, for generating an electric field between said roller and said body so as to transfer with a predetermined electrostatic charge the nonmagnetic toner portion of said mixture formed on the outer peripheral surface of the hollow cylindrical body onto an outer peripheral surface of the developing roller, whereby said nonmagnetic toner transferred onto the outer peripheral surface of the developing roller is jumped onto the electrostatic latent image-forming surface as the developing roller rotates by virtue of the electrostatic charge imparted to said transferred nonmagnetic toner by said voltage impressing means interacting with the electrostatic charge of said latent image to thereby develop said latent image.

4,508,053

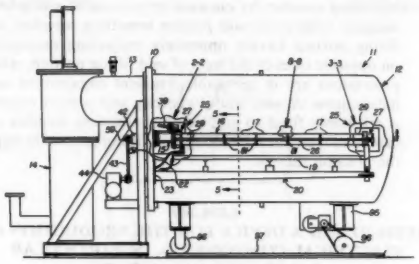
VACUUM DEPOSITION APPARATUS FOR MANUFACTURING SELENIUM PHOTORECEPTORS

Richard C. Eriksson, Kingston, Mass., assignor to XIS, Incorporated, W. Groton, Mass.

Filed Jan. 5, 1983, Ser. No. 455,828

Int. Cl.³ C23C *13/12*

U.S. Cl. 118—712 **18 Claims**



1. Vacuum deposition apparatus comprising:

a vacuum chamber;

vacuum pump means for reducing the pressure in said chamber;

mandrel means disposed within said chamber and adapted to support and electrically isolate from each other a plurality of hollow cylindrical substrate electrode units to be coated;

electrical coupling means for connection to said electrode units;

power supply means connected to said electrical coupling means and adapted to establish between said hollow electrode units potential gradients that produce a glow discharge externally and internally thereof and resultant heating thereof; and

a source means for providing an evaporative coating for deposition on the heated electrode units.

4,508,054

DEVICE FOR DEPOSITING A MINERAL OXIDE COATING ON A SUBSTRATE

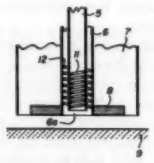
Otto Baumberger, Carouge, and Reinhard Kalbskopf, Vordenwald, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Division of Ser. No. 440,225, Nov. 3, 1982,. This application Dec. 21, 1983, Ser. No. 550,938

Claims priority, application Switzerland, Mar. 6, 1981, 1520/81

Int. Cl.³ C23C *13/10*

U.S. Cl. 118—718 **5 Claims**



1. A device for coating a substrate with a layer of mineral material which comprises:

means for moving a high-temperature substrate past a coating location; and

a set of parallel nozzles for dispersing at least one reagent

onto said substrate at said location, each of said nozzles comprising:

a first central pipe for conveying a first gaseous flow,

a second pipe coaxial with said first pipe for conveying a second gaseous flow, said reagent being present in a mixture of said flows,

baffles formed in at least one of said pipes over at least part of the length thereof, said baffles acting in different directions to one another for imparting to said gaseous flows a counter-rotational movement with respect to one another such that said gaseous flows meet at the mouth of said nozzle at an angle of at least 60° for inducing an impact meeting of the two flows, whereby said flows are mixed substantially instantaneously, and

an annular deflector formed on said second pipe cencentrically therewith at the mouth of said nozzle for spreading out reaction gases between said nozzle and said substrate.

4,508,055

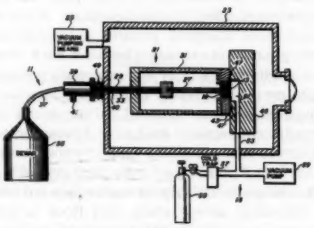
DEVICE FOR CRYOGENICALLY FABRICATING SOURCE MATERIAL FOR PLASMA X-RAY LASERS

Raymond C. Elton, Potomac; Robert H. Dixon, Bowie, and James L. Ford, Upper Marlboro, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 3, 1983, Ser. No. 500,725

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—724 **11 Claims**



1. A device for fabricating a target of a pump material and a lasing material for lasing at X-ray wavelengths, wherein one of the materials is normally solid and the other material is normally gaseous, comprising:

cooling means for cooling a substrate of the normally-solid material below the freezing point of the normally-gaseous material, including a thermally conducting block having a bottom face, a side wall, and a top face, the top face including a recess for mounting a substrate of the normally solid material; and

supply means for supplying a continual source of gaseous atmosphere of the normally-gaseous material to the cooled substrate so that a frozen layer of the normally gaseous material condenses onto the substrate to form the target.

4,508,056

TARGET HOLDER WITH MECHANICAL SCANNING

Michel Bruel, Veurey; Jean Escaron, Sassenage, and Joseph Labartino, Voreppe, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 16, 1983, Ser. No. 504,875

Claims priority, application France, Jun. 24, 1982, 82 11077

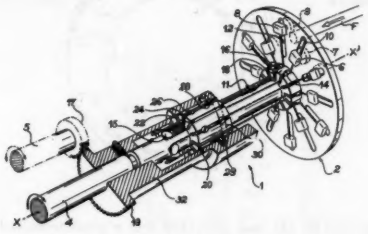
Int. Cl.³ H01L *21/265*

U.S. Cl. 118—730 **13 Claims**

1. A target holder of the type comprising:

several target supports mounted on a plate rotatable with respect to an axis in order that said supports in turn pass in front of a high energy beam at a predetermined angular position with respect to the plate rotation axis, and

means for displacement of each support relative to the plate between two end positions in a direction having a radial component, said displacement means being constructed such that a radial component displacement increment of



each said support between any two moments corresponding to any two consecutive passages of said support in front of said predetermined angular position is constant for said movement of said support between said end positions and such that each said support always has the same orientation relative to the plate at each passage in front of said predetermined angular position.

4,508,057

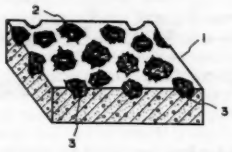
ALGAL CULTURING REEF UNIT, ARTIFICIAL REEF UNIT AND ARTIFICIAL CULTURING AND FISHING FIELD UNIT

Tetsuo Suzuki, Sabae, Japan, assignor to Tokyu Musashi Mfg. Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1983, Ser. No. 533,024

Int. Cl.³ A01K *61/00*

U.S. Cl. 119—3 **9 Claims**



4. An artificial reef unit comprising one or more concrete blocks presenting a plurality of curved surfaces each provided with a multiplicity of recesses adapted for habitation by sea urchin and shellfish, wherein each curved surface is provided with a layer consisting of a mixture of acid, fine powders of iron oxide and a concrete penetrant in turn consisting essentially of a surfactant, said layer penetrating well into the body of the concrete.

4,508,058

MILKING METHOD AND AN APPARATUS THEREFOR

Sten Jakobson, Södertälje, Sweden, and Karl Rabold, Schwäbisch Hall, Fed. Rep. of Germany, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 30, 1983, Ser. No. 480,575

Claims priority, application Sweden, Apr. 8, 1982, 8202278

Int. Cl.³ A01J *5/00*; A01K *1/12*

U.S. Cl. 119—14.02 **10 Claims**

1. A method of milking cows which are permitted to go loose and find their way individually to one or more stalls constructed for feeding, in which the cows are automatically identified and fed with the aid of a computer connected to the

identification and feeding means used, wherein the computer is utilized, on one hand, to record the points of time at which every cow is milked and, on the other hand, to activate—in connection with the identification of a cow arriving at a feed-

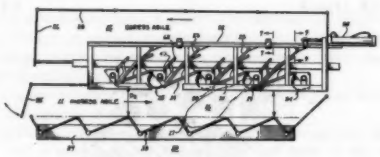
ing stall to eat, and provided that a predetermined time has passed after the cow in question was last milked—a device for automatic application of milking means to the udder of the cow and for starting a milking operation, while the cow is prevented from leaving the stall during milking.

4,508,059

MILKING BARN

Bernard O. Anderson, Glendale, Ariz., assignor to Nielsen Industries, Inc., Phoenix, Ariz.

Filed Feb. 10, 1984, Ser. No. 578,960
Int. Cl.³ A01K *1/12*
U.S. Cl. 119—14.03 **10 Claims**



1. In a stall at least one pair of adjacent cow stations comprising, a tail assembly for receiving the rear portions of at least two adjacent cows,

a vertical feedbowl framework rotatably mounted on a fixed axis at the head portion of each adjacent cow station for rotation between ingress, milk, and egress positions,

each of said feedbowl frameworks cooperating with a respective one of said adjacent rear portions to form an individual cow stall,

the space between the line of said feedbowl frameworks and said rear portions defining an ingress aisle and direction for cows,

the space on the opposite side of said line of feedbowl frameworks from said rear portions defining an egress aisle and direction,

gate means associated with each of two adjacent feedbowl frameworks for opening and closing the passageways between said ingress and egress aisles for each particular station,

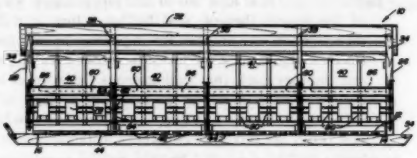
and means forming part of each of said feed bowl frameworks for increasing the width of said ingress aisle in the ingress positions of said feedbowl frameworks and decreasing the width of said ingress aisle in the milk positions of said feedbowl frameworks.

4,508,060

SKID MOUNTED MULTIPLE WEANING CALF ENCLOSURE

Jan J. Schulte, Rte. 1, Dorchester, Iowa 52140

Filed Jan. 12, 1984, Ser. No. 570,240
Int. Cl.³ A01K *1/00*
U.S. Cl. 119—16 **8 Claims**



1. A skid mounted multiple weaning animal enclosure, said enclosure including an elongated floor structure having opposite end and front and rear marginal portions, a pair of elongated ground skids supported beneath and extending along said front and rear marginal portions and projecting outwardly beyond said end marginal portions, opposite end walls extending across and projecting upwardly from said end marginal portions and a rear wall extending along and projecting upwardly from said rear marginal portion and joining the rear ends of said end walls, a roof structure extending between and interconnecting the upper marginal portions of said rear and end walls, a plurality of upstanding posts spaced along said front marginal portion and between said end walls and supporting corresponding marginal portions of said roof structure from said front marginal portion, a front-to-rear extending upstanding partition extending between each of said posts and a corresponding portion of said rear wall, horizontally swingable gate means removably closing the forward end of each area disposed between adjacent partitions and each end wall and the adjacent partition each of said areas including a plurality of front-to-rear extending supplemental partitions dividing each area into a plurality of individual animal stalls, whereby each gate means removably closes the forward ends of a plurality of individual animal stalls, said floor structure defining front-to-rear extending slots therein of sufficient width to allow substantial amounts of manure to fall through said slots, at least one set of corresponding ends of said ground skids including means for anchoring one or more tow members thereto preparatory to skidding said enclosure lengthwise over the ground a distance at least equal to the length of said enclosure, and further wherein each of said gate means includes upstanding free-swinging and hinged edge portions, said hinged edge portions being defined by upstanding rod members, adjacent gate means being disposed with the rod members thereof in closely spaced side-by-side relation, each pair of closely spaced rod members being pivotally supported from a corresponding post by staples driven into the post and rotatably receiving the rod members therethrough.

4,508,061

NIPPLE FEEDER FOR DISPENSING DRY FEED

David Swearingin, R.R. 5, Carrollton, Mo. 64633

Filed Nov. 15, 1983, Ser. No. 551,938
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—51 R **4 Claims**

1. An improved hog-feeding apparatus comprising:

(a) a supply conduit adapted to receive solid granular feed at an open upper extremity, and discharge said feed at a lower extremity,

(b) an elongated feed tube communicating with the lower extremity of said supply conduit and disposed in a substantially horizontal position, said tube having a substantially closed rearward extremity and a forwardly directed outlet extremity,

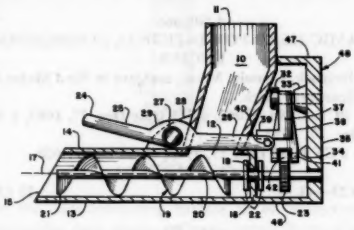
(c) auger means rotatively positioned within said tube in coaxial alignment therewith,

(d) means to prevent axial movement of said auger means within said tube,

(e) a shaft associated with said auger means and coaxially disposed therewith,

(f) means for rotating said shaft, and

(g) a spring-biased lever adapted for pivotal movement in a



vertical plane, having a forward extremity disposed in sufficiently close juxtaposition to the forward extremity of said feed tube to permit engulfment of said juxtaposed forward extremities by a hog's mouth, and having a rearward extremity mechanically coupled to said means for rotating said shaft, whereby

(h) forceful depression of the forward extremity of said lever by a hog's mouth activates said means for rotating said shaft.

4,508,062

POULTRY-HARVESTING ASSEMBLY

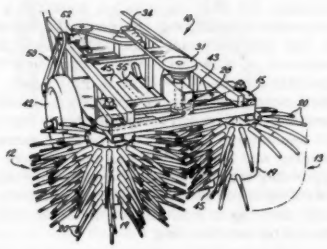
Paul S. Berry, Bromham; Peter J. Kettlewell, Didsbury, and Michael J. B. Turner, Clophill, all of England, assignors to National Research Development Corporation, London, England

Filed Oct. 25, 1983, Ser. No. 545,260

Claims priority, application United Kingdom, Oct. 29, 1982, 8230964

Int. Cl.³ A01K *29/00*

U.S. Cl. 119—82 **14 Claims**



1. A poultry-harvester, comprising: a mobile support;

two rotors arranged side by side for rotation about substantially vertical axes; means for mounting said rotors to said support;

a continuous array of radially-extending flexible guide elements provided on each rotor, said guide elements of one rotor extending towards the guide elements of the other rotor in close proximity therewith defining a bird-accepting region between the two rotors; and

drive means for contra-rotating said two rotors about said substantially vertical axes whereby poulty in said bird-accepting region are moved rearwardly of the harvester.

4,508,063

MOBILE POSITIONING BODY INTRODUCTION DEVICE

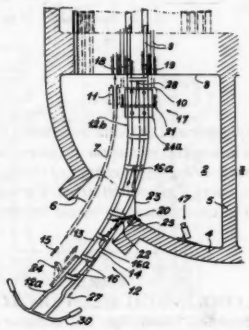
Maxime Monne, Paris, France, assignor to INTERCONTROLE Société Anonyme, France

Filed May 16, 1983, Ser. No. 494,935

Claims priority, application France, May 19, 1982, 82 08787

Int. Cl.³ F22B *37/42*

U.S. Cl. 122—504 **5 Claims**



1. A device for introducing a mobile positioning body for a member onto a tube plate of a steam generator, said generator comprising a water box having a wall provided with a manhole, said device comprising:

a structure defined by two substantially parallel rails joined by crosspieces, each of said rails having an upper end and a lower end and said structure also having an upper end and a lower end and being substantially shaped like a curved angle plate,

means for provisionally fixing said structure to the tube plate,

means for provisionally fixing said structure in the vicinity of the manhole comprising a lever having two ends, one end of which is pivotally fixed to said structure, a pedal mounted at the other end of said lever, a spring having two ends, one end of which is fixed to said structure and the other end of which is fixed to said lever, and means for pivotally moving said lever operable from outside the water box and behind the manhole comprising a cable having two ends, one end of which is fixed to said lever and the other end of which is outside the water box, and

means for moving the mobile positioning body along the rails.

4,508,064

INTERNAL COMBUSTION ENGINE OF HYDROGEN GAS

Kenji Watanabe, Kagoshima, Japan, assignor to Katsuji BABA, Kagoshima, Japan, a part interest

Filed Sep. 28, 1982, Ser. No. 425,915

Claims priority, application Japan, Nov. 12, 1981, 56-180409; Feb. 3, 1982, 57-14819; Feb. 3, 1982, 57-14820

Int. Cl.³ F02B *75/12*

U.S. Cl. 123—1 A **7 Claims**

1. In a hydrogen gas fueled internal combustion engine, the improvement comprising:

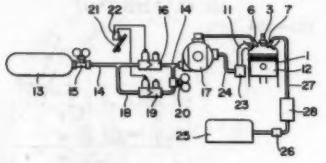
a hydrogen gas jet nozzle provided in a combustion chamber of the engine to directly jet hydrogen gas as fuel into the combustion chamber;

a source of water at ambient or room temperature; and

a water spray jet nozzle coupled to said water source, said water spray jet nozzle being provided in said combustion chamber, separately and independently of said hydrogen gas jet nozzle, to directly jet a spray of said ambient or

room temperature water into said combustion chamber substantially simultaneously with the jetting in of the hydrogen gas;

the air in said combustion chamber being compressed so that the water sprayed into said combustion chamber is instantly vaporized to steam by igniting of the hydrogen gas jetted into said combustion chamber, thereby utilizing the combustion/explosion energy of the hydrogen gas and the steam energy generated from the vaporization of the steam in combination to obtain mechanical dynamic energy.



4,508,065

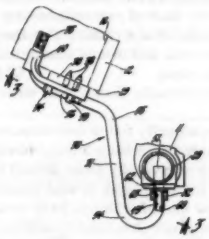
PISTON COOLING OIL DELIVERY TUBE ASSEMBLY

Jagan N. Suchdev, Woodridge, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1983, Ser. No. 476,988

Int. Cl.³ F01P *3/08*

U.S. Cl. 123—41.35 **4 Claims**



1. A piston cooling oil delivery tube assembly for an internal combustion engine having a crankcase supporting a removable cylinder liner with a hollow piston carried for reciprocation therein and having inlet means to receive cooling oil within the hollow piston, an oil distribution manifold carried in the crankcase near an open end of the cylinder liner and connected with a source of pressurized cooling oil, wherein said tube assembly includes

passage defining means including a tube having two ends, one connectable with said manifold, and a nozzle at the other of said ends, and

support means including a bracket attached near the nozzle end of the tube for fixing said tube to the cylinder liner with the nozzle in alignment with the piston cooling oil inlet means and a flange near said one end of the tube for securing said one end to said manifold,

the portion of said tube extending between said bracket and said flange including a return bend and having a length sufficient to permit limited resilient flexure to accommodate minor relative movement and dimensional variations between the manifold and cylinder mounting locations, and the improvement wherein

said bracket forms a portion of said passage defining means having a curved passage portion connected between said tube other end and said nozzle, said tube and nozzle being separately formed and individually connected with said bracket,

said nozzle being preformed as a short stiff member and assembled to said bracket to provide, at assembly, a fixed alignment with the piston cooling oil inlet means not requiring gaging or adjustment of the nozzle position after assembly, while said tube maintains limited flexibility between the bracket and flange.

4,508,066

CERAMIC HEAD FOR INTERNAL COMBUSTION ENGINE

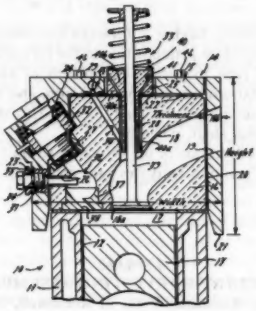
Dale L. Hartsock, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/02042, § 371 Date Dec. 27, 1983, § 102(e) Date Dec. 27, 1983

PCT Filed Dec. 27, 1983, Ser. No. 571,655

Int. Cl.³ F02B *75/08*

U.S. Cl. 123—41.71 **10 Claims**



1. An insulating head assembly for an internal combustion engine having a cylinder block with walls defining at least one bore opening in each of which a piston reciprocates, said assembly comprising:

(a) entirely a case ceramic body having a side wall and another wall fitting over said cylinder block to define with said piston and cylinder block a combustion chamber, said ceramic body having passage means through said body providing for flow of inducted combustion gases and compressed exhaust gases between said combustion chamber and said body side wall, said ceramic body being comprised of a material with a coefficient of thermal expansion less than 1.0×10^{-6} in/in/°F.; and

(b) shell means enveloping and spaced from said body via compliant members and being effective to trap heat within said combustion chamber and passage means sealingly clamping said ceramic body to said cylinder block and supportably carrying means extending into said body for controlling the flow of gases through said body, said shell means carrying at least part of the compressive loading imposed by said clamping.

4,508,067

TAPPET AND A CAM CONTACT MEMBER THEREFOR

Wolfgang Fuhrmann, Nuremberg, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg AG, Nuremberg, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,677

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308550

Int. Cl.³ F01L *1/14*

U.S. Cl. 123—90.49 **16 Claims**

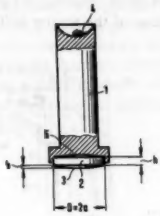
1. A tappet for cam operation, comprising:

a tappet-body shank for tappet operation from one end;

a generally-spherical, convex, cam-contacting surface on the

other end of the shank for contacting the cam in the cam operation; and

a cavity between the cam-contacting surface and the facing portion of the shank, the cavity being sufficiently close to the cam-contacting surface relative to the material thereof



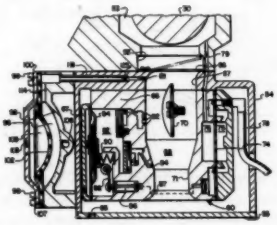
for the cam-contacting surface to be deflected theretoward by each maximum cam-contact force of the cam operation thereon equally to the sphericity of the cam-contacting surface, whereby the wear from the cam contact is reduced.

4,508,068

FUEL MIXTURE ENRICHMENT SYSTEM FOR INTERNAL COMBUSTION ENGINE

Lloyd H. Tuggle, Shreveport, and Michael J. Ferlito, Bossier City, both of La., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 9, 1983, Ser. No. 502,474
Int. Cl.³ F02N *17/00*
U.S. Cl. 123—187.5 R **46 Claims**



1. A fuel-air mixture enriching system for starting an internal combustion engine, said engine including a carburetor having air flow passage means therein, and a throttle valve disposed for throttling air flow through said carburetor, and further passage means interconnecting said carburetor air flow passage means with a combustion chamber of said engine, a source of liquid fuel, and means interconnecting said fuel source with said carburetor, said mixture enriching system comprising:

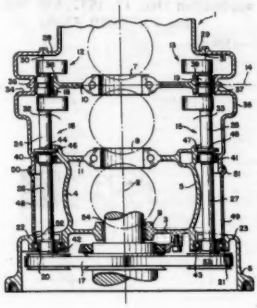
means forming a reservoir chamber having a predetermined volume in communication between said fuel source and one of said plurality of passage means, pump means for delivering fuel to said reservoir chamber prior to cranking of the engine, and conduit means for conducting fuel from said reservoir chamber into said one passage means responsive to a lower pressure developed in said air passage means by reciprocation of the piston to provide an enriched fuel-air mixture for induction into said combustion chamber during a starting cycle of said engine.

4,508,069

INTERNAL COMBUSTION ENGINE BALANCE SHAFT BEARING ARRANGEMENT AT THE CRANKCASE

Helmut Dobler, Esslingen; Rolf Zeller, Burgstetten, and Helmut Seitz, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,008
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1983, 3314801
Int. Cl.³ F16F *15/26*
U.S. Cl. 123—192 B **19 Claims**



1. A bearing arrangement for balance shafts running parallel to a crankshaft on both side walls of a crankcase of an internal combustion engine for balancing of second order inertia forces, driven ends of the balance shafts being held approximately in a plane of a crankcase end face and ends of the balance shafts lying in the region of the transverse central plane of the crankshaft, the balance shaft carrying balance weights held by bearings on the crankcase, the bearings supporting the balance weights consisting of journal bearings connected to a lubricant circuit of the internal combustion engine, wherein the journal bearings are located within the crankcase and the bearings present at the driven ends of the balance shafts comprise rolling bearings with permanent lubrication located outside the crankcase.

4,508,070

ARRANGEMENT IN THE COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Peter O. Buggert, Stockholm, Sweden, assignor to Oktan Aktiebolag, Stockholm, Sweden

Filed Apr. 4, 1983, Ser. No. 481,885
Claims priority, application Sweden, Apr. 19, 1982, 8202442
Int. Cl.³ F02F *7/00*; F16J *11/00*
U.S. Cl. 123—193 CP **8 Claims**

1. In an internal combustion engine having at least one combustion chamber with a piston operable therein, the combustion chamber being supplied with preferably lead-containing petrol or the like and having electric ignition, the improvement wherein an area of at least one of a surface of the combustion chamber and a head surface of the piston has means for

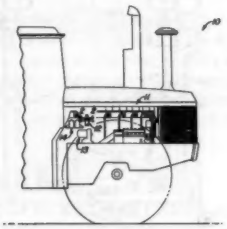
reducing the octane number requirements of the engine, said means being constituted by a very fine surface structure comprising depressions, such as a plurality of grooves, said depressions being distributed throughout said area and each having a width up to about 3 microns and a depth up to about 1 micron.

4,508,071

CANISTER RETAINER ASSEMBLY

David D. Drenner, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 172,365, Jul. 25, 1980, Pat. No. 4,386,588.
This application Dec. 17, 1982, Ser. No. 450,593
Int. Cl.³ F02B *77/00*
U.S. Cl. 123—198 A **8 Claims**



1. A canister retainer assembly capable of holding an aerosol canister in an upright position against an electric solenoid valve associated with an engine and of sealing said electric solenoid valve from outside air when no canister is present, said electric solenoid valve including an inlet opening, a rubberized gasket surrounding said inlet opening, a plunger movably positioned within said inlet opening, and means for activating said plunger to contact an outlet valve located in the top of said aerosol canister to release pressurized fluid from said aerosol canister, said assembly comprising:

(a) a collar-shaped adapter secured to said electric solenoid valve which has an end surface with an opening therein, said adapter further having threads formed on an inner circumferential surface approximate said open end; and

(b) a canister holder having a hollow cylindrical body which is opened at one end and closed at a second end, and further having first and second spaced apart helical threads formed on the outer circumference thereof such that said first threads are located adjacent to said open end and said second threads are located adjacent to said closed end, said first threads being engageable with said threads formed on said adapter to position said holder in a first position wherein said holder is capable of retaining said aerosol canister in an upright position against said electric solenoid valve and said second threads being engageable with said threads formed on said adapter to position said holder in a second position wherein said holder is inverted 180 degrees to seal said electric solenoid valve from contamination when no aerosol canister is present.

4,508,072

SEALING DEVICE FOR TIMING BELT COVER AND ENGINE MOUNT BRACKET

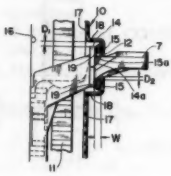
Toshihiro Takami, and Masahiro Isobe, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 29, 1983, Ser. No. 490,201
Claims priority, application Japan, Feb. 12, 1983, 58-018096[U]
Int. Cl.³ F02B *77/00*
U.S. Cl. 123—195 C **16 Claims**

1. A sealing device for a timing belt cover and an engine mount bracket, said timing belt cover being provided with an opening and said engine mount bracket penetrating through said opening, said sealing device comprising:

a rib formed on said engine mount bracket, said rib being situated apart from a portion of the timing belt cover surrounding the opening and being opposite to said portion of the timing belt cover surrounding the opening; and

a gasket made of an elastic material interposed between said rib and said portion of the timing belt cover surrounding



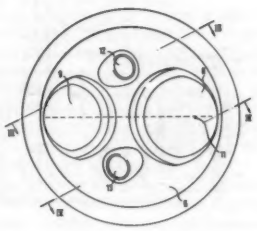
the opening, said gasket having a lip of C-shaped section and a fixed portion continuous from said lip of C-shaped section and extending along said portion of the timing belt cover surrounding the opening, and said fixed portion of the gasket being fixed to said portion of the timing belt cover surrounding the opening, and said lip of C-shaped section of the gasket being in contact with said rib of the engine mount bracket.

4,508,073

COMBUSTION SPACE OF A PISTON DRIVEN INTERNAL COMBUSTION ENGINE

August Hofbauer, Pforzheim, and Michael Beer, Leonberg, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche A.G., Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 509,820
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224337
Int. Cl.³ F02F *3/24*
U.S. Cl. 123—307 **13 Claims**



1. A combustion space of a reciprocating piston internal combustion engine having piston means and cylinder head means for delimiting a combustion space, said combustion space being located in part within the piston means and in part within the cylinder head means, recess means centrally disposed in an end surface of said piston means and an upwardly arched wall in said cylinder head means together forming a substantially axially symmetrical combustion space, said upwardly arched wall including an inlet valve and an exhaust valve and means for causing ignition, said piston means with said recess means and said cylinder head means cooperating to form an endless vortex flow from an outer potential flow and an inner concentric rotary flow in the combustion space by dimensioning and coordination to the inlet valve and exhaust valve, the axes of the inlet valve and the exhaust valve each being disposed at an acute angle to the piston axis, the means for ignition including at least two spark plugs with ignition

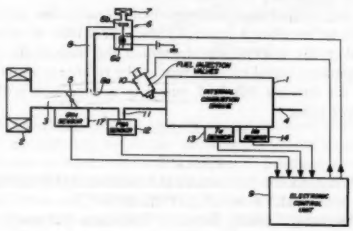
electrodes protruding into the combustion space, one of said at least two spark plugs being disposed on an opposite side of a plane passing through the axes of the intake and exhaust valves from another of said at least two spark plugs, and ignition electrodes of said opposed spark plugs being disposed at different distances from the piston axis such that when the middle diameter of a mixing zone of high fuel concentration formed between the rotary flow and the potential flow increases with decreasing engine rotational speed the mixing zone moves such that one of the opposed ignition electrodes is in the mixing zone and when the middle diameter of the mixing zone decreases, another of the opposed ignition electrodes is in the mixing zone.

4,508,074

INTAKE AIR QUANTITY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES AT TERMINATION OF FUEL CUT OPERATION

Akihiro Yamato, Shiki, and Makoto Hashiguchi, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1984, Ser. No. 615,057
Claims priority, application Japan, Jun. 16, 1983, 58-108239
Int. Cl.³ F02D 9/06
U.S. Cl. 123—327 **2 Claims**



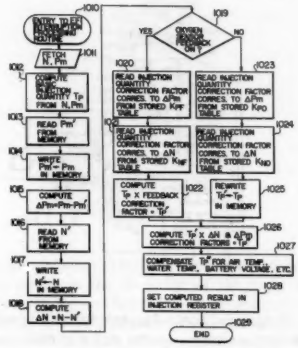
1. A method of controlling the quantity of intake air being supplied to an internal combustion engine, said engine having means for increasing the quantity of intake air being supplied to said engine by a required amount in response to operating conditions of said engine, said method comprising the steps of: (a) detecting the rotational speed of said engine when said engine is decelerating in a condition wherein the fuel supply to said engine is interrupted; (b) comparing the detected value of the rotational speed of said engine with a second predetermined rotational speed value which is higher than a first predetermined rotational speed value below which the interruption of the fuel supply to said engine should be terminated; (c) detecting the rate of decrease in the rotational speed of said engine when the detected value of the rotational speed of said engine decreases across said second predetermined rotational speed value; (d) determining whether or not the detected rate of decrease is larger than a predetermined value; and (e) actuating said intake air quantity increasing means when the detected rate of decrease in the rotational speed of said engine is larger than said predetermined value, for a predetermined period of time from the time the detected value of the rotational speed of said engine has decreased across said second predetermined rotational speed, to thereby increase the quantity of intake air.

4,508,075

METHOD AND APPARATUS FOR CONTROLLING INTERNAL COMBUSTION ENGINES

Mitsunori Takao, Kariya, and Toshiaki Mizuno, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 14, 1981, Ser. No. 311,395
Claims priority, application Japan, Oct. 17, 1980, 55-145402
Int. Cl.³ F02P 3/04; F02B 3/00
U.S. Cl. 123—339 **14 Claims**



1. An apparatus for controlling an internal combustion engine of the type having an electronically controlled fuel injection system effecting air-fuel ratio feedback compensation by using an oxygen sensor for sensing an oxygen content of an exhaust gas from said engine, in which at least one of a plurality of control variables of said engine is corrected in accordance with at least one of a plurality of operating parameters of said engine to stabilize at rotational speed of said engine, said apparatus comprising:

a sensor for detecting said one operating parameter; and

computing means comprising input/output means for receiving an output signal of said sensor, an interruption command unit, memory means, a computing unit and output means of said computing means, whereby in accordance with the determination as to whether said air-fuel ratio feedback compensation by using the oxygen sensor is effected or not by said electronically controlled fuel injection system and in accordance with data related to an amount of change of said one operating parameter obtained at intervals of a predetermined period, correction values for said control variable are computed, said control variable is corrected in accordance with said correction values, and a signal indicative of said corrected control variable is output from said output means,

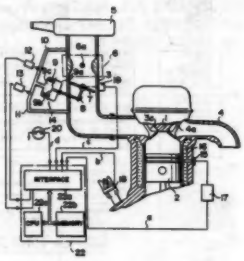
wherein said computing means has an interruption processing control program stored in said memory means thereby to perform said determination, computation, correction and outputting in response to an interruption command signal generated from said interruption command unit, and

wherein said memory means stores therein two different data maps to be used separately in dependence on whether said air-fuel ratio feedback compensation by using the oxygen sensor is effected or not, each of said data maps determining the relationship between the amount of change of said operating parameter and correction factors for computing correction values of said control variable, and wherein said interruption processing control program includes processing steps whereby correction factors for said control variable corresponding to the amount of change of said one operating parameter are read from a corresponding one of said data maps depending on whether said air-fuel ratio feedback compensation by using the oxygen sensor is effected or not.

4,508,076
IDLING SPEEDING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Tatsuro Oda; Hideki Tanaka; Sadashichi Yoshioka, and Katsuhiko Yokooku, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Aug. 11, 1983, Ser. No. 522,220
Claims priority, application Japan, Aug. 16, 1982, 57-141979
Int. Cl.[3] F02M 3/00
U.S. Cl. 123—339 7 Claims



1. An idling speed control system for an internal combustion engine having an intake system and a control valve disposed therein to control the amount of intake air fed to the engine, comprising

a rotational speed detecting means for generating a rotational speed signal representing the rotational speed of the engine,

an operating condition detecting means for generating an operating condition signal representing the operating condition of the engine,

a valve actuator which receives a valve driving signal and controls the position of said control valve,

a desired idling speed determining means for determining a desired idling speed taking into account the operating condition of the engine represented by the operating condition signal fed thereto,

a first value determining means which determines a first value according to the desired idling speed determined by the desired idling speed determining means, the first value being for moving said control valve to a temporary target position which is expected to be suitable to obtain the desired idling speed,

a second value determining means which determines a second value according to the difference between the actual rotational speed of the engine represented by the rotational speed signal fed from the rotational speed detecting means and the desired idling speed determined by the desired idling speed determining means, the second value being for correcting the position of the control valve to a final target position so that the actual rotational speed converges to the desired idling speed,

a driving signal generating means which generates the valve driving signal according to a third value which is derived from the first and second values respectively determined by the first value determining means and the second value determining means and feeds it to the valve actuator,

a first detecting means which detects that the actual rotational speed of the engine is equalized to the desired idling speed and generates a detecting signal;

a second detecting means which detects said third value at the moment when the first detecting means generates the detecting signal,

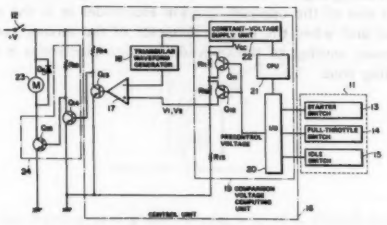
an averaging means for averaging a plurality of values detected by the second detecting means, and

a value correcting means which acts on the first value determining means to cause it to adopt the averaged value obtained by the averaging means as the first value.

4,508,077
FUEL PUMP CONTROL APPARATUS

Hiroyuki Shimbara, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 7, 1983, Ser. No. 501,798
Claims priority, application Japan, Jun. 14, 1982, 57-102497
Int. Cl.[3] F02D 31/00
U.S. Cl. 123—357 18 Claims



1. Apparatus for control of a fuel pump for an internal combustion engine of a vehicle, comprising:

means for sensing the operating state of the engine to produce a state signal indicative thereof;

means for computing an optimal precontrol voltage value in accordance with the state signal;

at least two series connected resistors connected between a source of voltage and ground;

means responsive to the optimal precontrol voltage value for short-circuiting at least one of said resistors in order to produce the comparison signal;

means for generating a reference signal having a predetermined frequency and waveform;

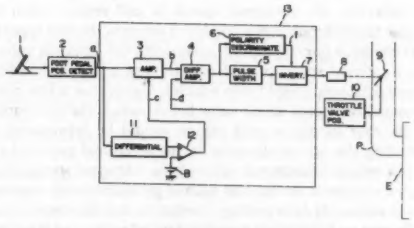
means for comparing the comparison signal to the reference signal to produce a control pulse, the width of which is equal to the interval during which the magnitude of the comparison signal exceeds that of the reference signal; and

means for driving the fuel pump in accordance with the control pulse.

4,508,078
ELECTRICALLY OPERATED ENGINE THROTTLE VALVE ACTUATING DEVICE

Nobuo Takeuchi; Tadashi Kaneko; Tadataka Nakazumi, and Katsuhiko Yokooku, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 8, 1983, Ser. No. 511,983
Claims priority, application Japan, Jul. 9, 1982, 57-120391
Int. Cl.[3] F02D 9/00
U.S. Cl. 123—399 5 Claims



1. Engine throttle valve operating means comprising:

a first detecting means for detecting the position of an engine throttle valve operating member and producing a first position signal corresponding to the position of the operation member;

a rate detecting means connected with said first detecting

means for receiving said first position signal therefrom and producing a rate signal corresponding to a rate of change per unit time of the position of the operation member;

a throttle valve actuating means for actuating the engine throttle valve means;

a throttle valve driving signal generating means responsive to said first position signal and said rate signal to produce a first drive signal for operating the actuating means in accordance with said first position signal when the rate of change per unit time of the position of the operating member is smaller than a predetermined value and generating a second drive signal for operating the actuating means in accordance with said first position signal by a greater extent than under said first drive signal when the rate of change per unit time of the position of the operating member is greater than the predetermined value.

4,508,079

KNOCKING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

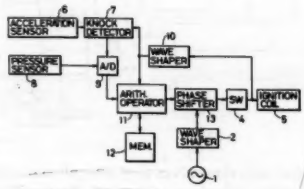
Satoshi Komurasaki; Atsushi Ueda; Yoshinobu Morimoto, and Youichi Kadota, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1983, Ser. No. 480,647

Claims priority, application Japan, Mar. 31, 1982, 57-55846; May 27, 1982, 57-91657; Jun. 14, 1982, 57-103646; Jun. 19, 1982, 57-106403; Jun. 19, 1982, 57-106429

Int. Cl.[3] **F02P** *5/14, 11/02;* **F02M** *59/20;* **F02D** *5/04*

U.S. Cl. 123—425 **20 Claims**



1. A knocking control system for an internal combustion engine, comprising; means for detecting a vibratory acceleration of said internal combustion engine to produce a vibratory output signal; knock detector means for removing noise components from said vibratory output signal to produce a knock signal whose signal level corresponds to the intensity of knocking; means for detecting a load condition of said internal combustion engine and producing a load output signal; means for receiving said knock signal and said load output signal and producing a digital output of detected load condition; means for detecting a speed of said internal combustion engine and producing a speed output to said knock detector means; means for storing a reference control value for supressing knocking; said reference control value corresponding to the detected load condition and the detected engine speed; means for producing a control output signal from said knock signal and said reference control value for controlling engine ignition, and

means for resetting said knock detector means at an interval corresponding to the ignition interval of said engine.

4,508,080

INJECTION QUANTITY CORRECTING DEVICE FOR DISTRIBUTION TYPE FUEL INJECTION PUMP

Hisashi Nakamura, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

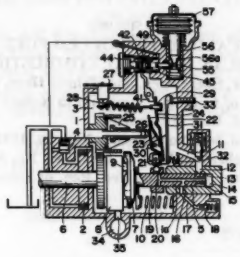
Filed Sep. 13, 1983, Ser. No. 531,641

Claims priority, application Japan, Sep. 24, 1982, 57-167124

Int. Cl.[3] **F02M** *39/00*

U.S. Cl. 123—449 **6 Claims**

1. In a distribution type fuel injection pump comprising a plunger that reciprocates and rotates simultaneously, a control sleeve adapted to shift on the plunger and changes the time of opening a cut off port, and a tension lever for adjusting the position of the control sleeve by receiving the action of a servo spring and a centrifugal governor; an injection quantity correcting device for the distribution type fuel injection pump comprising a piston connected to a lever for determining the maximum shifting position of the tension lever and being housed in a sliding hole and having a high pressure chamber



and a low pressure chamber at its both ends, a return spring for energizing this piston in the direction of the high pressure chamber, a servo valve provided in the piston and controls the pressure in the high pressure chamber by the pressing force of a servo spring and the pressure in the opposed pump chamber, and a pressure responding member for changing the setting force of the servo spring that applies the pressure to the servo valve.

4,508,081

FUEL INJECTION PUMP

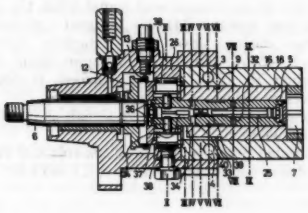
Yoshiya Takano, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 516,911

Claims priority, application Japan, Jul. 26, 1982, 57-128931

Int. Cl.[3] **F02M** *39/00*

U.S. Cl. 123—450 **5 Claims**



1. A fuel injection pump for an internal combustion engine comprising:

a rotor disposed in a housing and being rotatable according to rotation of the engine;

a pressure chamber formed in said rotor;

a first free piston slidably inserted in said pressure chamber, and dividing said pressure chamber into a first pump chamber and a second pump chamber, said first pump chamber being communicable with the interior of the engine through delivery passages and said second pump chamber being communicable with discharge passages for discharging the fuel therein;

means for pressurizing fuel in said pressure chamber according to the rotation of said rotor thereby delivering fuel to the engine;

a pair of preparatory chambers for metering and supplying fuel into said pressure chamber, each of said preparatory chambers being provided with a second free piston which

divides its preparatory chamber into first and second preparatory chambers; and

a pair of electromagnetic valves for controlling feeding of fuel to respective ones said first preparatory chambers, wherein said electromagnetic valves are arranged to communicate directly with respective ones of said first preparatory chambers for supplying fuel thereto without intervening valves.

4,508,082

ELECTRONICALLY CONTROLLED FUEL METERING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

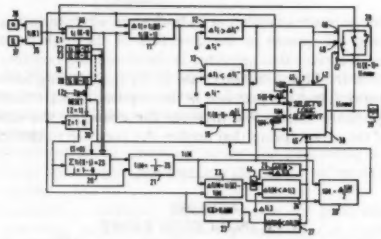
Wolfram Becker, Eberdingen, and Helmut Denz, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 326,089, Nov. 30, 1981, abandoned. This application Mar. 6, 1984, Ser. No. 602,622

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046863

Int. Cl.³ F02D *5/00*

U.S. Cl. 123—478 **8 Claims**



1. An electronically controlled fuel metering system for an internal combustion engine having a metering signal generating circuit for forming a basic metering signal comprising:

means for generating an output signal ti_{new},

said output signal generating means forming at least two of the following signals in dependence upon engine conditions: (1) an up-to-date load signal ti(K); (2) an average value load signal ti(M); (3) a signal indicating engine overrun during slow load reduction according to $ti(K-1)+\Delta ti/2$; and (4) form an approximate load signal according to $tiM=\Delta tiM/2$, wherein ti=load signal, K=present value and M=average value,

means selecting one of the above signals as said output signal, and wherein

said generated output signal ti_{new} controls fuel metering in accordance with at least one of ti(K) and tiM.

4,508,083

ELECTRONIC FUEL INJECTION CONTROL SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINES

Shumpei Hasegawa, Niiza, and Akihiro Yamato, Sayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Matsushita Electric Industrial Co., Ltd., Osaka, both of, Japan

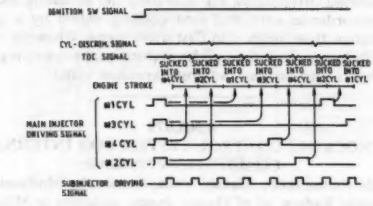
Filed Nov. 18, 1982, Ser. No. 442,620

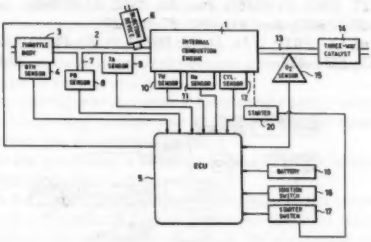
Claims priority, application Japan, Nov. 24, 1981, 56-187982

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—491 **7 Claims**

1. An electronic fuel injection control system for electronically controlling the quantity of fuel being supplied to an internal combustion engine having a pluraity of cylinders, an output shaft, an ignition device, and an ignition switch adapted to energize said ignition device when closed, comprising: a sensor for detecting at least one predetermined angular position of said output shaft of said engine to generate a signal indicative of a detected angular position; a plurality of fuel injection valves corresponding in number to said cylinders, each provided for each of said cylinders; and a control circuit adapted to cause opening of said fuel injection valves in synchronism with generation of said angular position signal, for supplying a controlled amount of fuel into said cylinders, said control circuit being operable to cause opening of all said fuel injection valves at the same time to supply fuel into respective ones of said cylinders for one predetermined time interval immediately upon closing of said ignition switch, keep closing





of all said fuel injection valves until after all said cylinders have pistons thereof complete respective first suction strokes thereof after said closing of said ignition switch, and upon completion of said first suction strokes of all said cylinders, cause successive opening of said fuel injection valves in predetermined sequence in synchronism with subsequent generation of said angular position signal occurring after the completion of said first suction strokes of all said cylinders to supply fuel to respective ones of said cylinders.

4,508,084

METHOD FOR CONTROLLING A FUEL METERING SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Akihiro Yamato, Shiki, and Akihiko Koike, Urawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,301

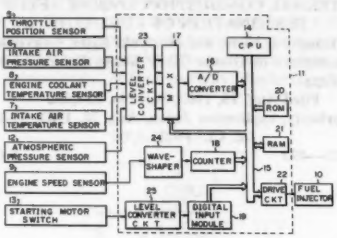
Claims priority, application Japan, Aug. 16, 1982, 57-141824

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—492 **5 Claims**

1. A method for controlling a fuel metering system of an internal combustion engine, comprising a sequence of calculation steps for calculating a quantity of fuel to be delivered to power cylinders of said engine in response to engine operating conditions determined in accordance with a plurality of parameters, including a first step for calculating a first value indicative of an increment of fuel supply responsive to one of said operating conditions, a second step for calculating a second value indicative of an increment of fuel supply responsive to

another one of said operating conditions, and a step for comparing said first and second values and selecting the larger one



of said first and second values for said calculation of the quantity of fuel.

4,508,085

FUEL INJECTION CONTROL METHOD FOR MULTI CYLINDER INTERNAL COMBUSTION ENGINES OF SEQUENTIAL INJECTION TYPE AT ACCELERATION

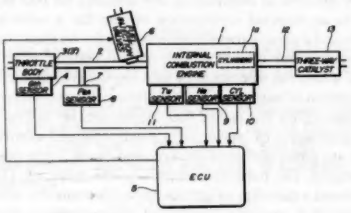
Akihiro Yamato, Shiki, Japan, assignor to Honda Motor Co., Ltd., Tokyo, Japan

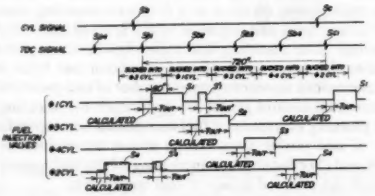
Filed Apr. 30, 1984, Ser. No. 605,681

Claims priority, application Japan, Jun. 15, 1983, 58-107547

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—492 **6 Claims**





1. A method of controlling the supply of fuel to an internal combustion engine having a plurality of cylinders at acceleration thereof, wherein operating conditions of said engine are detected, the quantity of fuel being supplied to said engine is set to a value appropriate to the detected operating condition of said engine upon generation of each pulse of a trigger signal, and sequential injections of the set quantity of fuel are effected into said cylinders in predetermined sequence in synchronism with generation of pulses of said trigger signal, the method comprising the steps of: (1) determining whether or not said engine is operating in an accelerating condition; (2) setting an acceleration fuel increment at the time of generation of a present pulse of said trigger signal, when it is determined that said engine is operating in said accelerating condition; and (3) effecting an additional injection of fuel at the time of generation of said present pulse of said trigger signal, in a quantity corresponding to the set acceleration fuel increment into one of said cylinders into which one of said sequential injections was effected at the time of generation of a preceding pulse of said trigger signal.

4,508,086

METHOD OF ELECTRONICALLY CONTROLLING FUEL INJECTION FOR INTERNAL COMBUSTION ENGINE

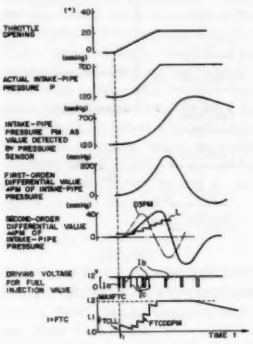
Toshimitsu Ito, and Kazuhiko Norota, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 4, 1984, Ser. No. 607,307

Claims priority, application Japan, May 9, 1983, 58-80622; May 9, 1983, 58-80623; May 9, 1983, 58-80624; May 9, 1983, 58-80625

Int. Cl.³ F02B *3/00, 33/00*

U.S. Cl. 123—492 **16 Claims**


THROTTLE OPENING
ACTUAL INTAKE-PIPE PRESSURE P
INTAKE-PIPE PRESSURE PM AS VALUE DETECTED BY PRESSURE SENSOR
FIRST-ORDER DIFFERENTIAL VALUE dPM OF INTAKE-PIPE PRESSURE
SECOND-ORDER DIFFERENTIAL VALUE d²PM OF INTAKE-PIPE PRESSURE
DRIVING VOLTAGE FOR FUEL INJECTION VALVE
TIME

13. A method of electronically controlling a fuel injection for an internal combustion engine wherein fuel is injected in asynchronism with a crank angle when a throttle valve is open and the rate of change of an engine load takes a positive value, comprising the steps of:

obtaining a second-order differential value of the engine load with respect to time which is defined as the rate of change of a change rate of the engine load, and a third-order differential value of the engine load with respect to time which is defined as the rate of change of said second-order differential value;

injecting a first quantity of fuel during a period from a point of time when the throttle valve at fully closed position is opened until a predetermined period of time has elapsed and when said second-order differential value is not less than a first reference value and said third-order differential value is not negative; and

injecting a second quantity of fuel after said predetermined period of time has elapsed and when said second-order differential value is not less than a second reference value and said third-order differential value is not negative.

4,508,087

METHOD FOR CONTROLLING FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE AFTER TERMINATION OF FUEL CUT

Akimasa Yasuoka, Tokyo, and Yutaka Otobe, Shiki, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,672

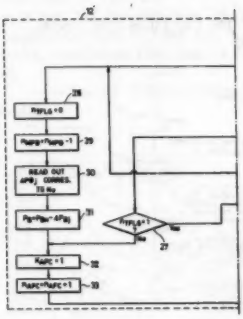
Claims priority, application Japan, Jun. 23, 1982, 57-107952

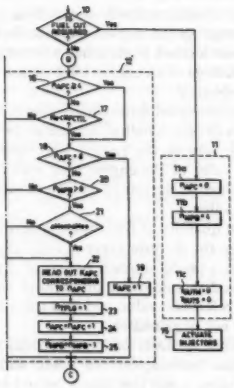
Int. Cl.³ F02B *3/00*

U.S. Cl. 123—493 **6 Claims**

1. A method for controlling the quantity of fuel being supplied to an internal combustion engine, to a required quantity,

by increasing the fuel quantity by an increment which is set in synchronism with generation of pulses of a predetermined control signal generated at a predetermined crank angle of said engine, after termination of a fuel cut operation which is effected when said engine is operating in a predetermined operating condition while it is decelerating, the method comprising the steps of: (1) detecting a transition of the operative state of said engine from said predetermined operating condition wherein the fuel supply to said engine is to be cut off to another





operating condition wherein the fuel supply is to be effected; (2) detecting the magnitude of a variation in the rotational speed of said engine and determining whether or not said detected magnitude of variation is larger than a predetermined value; and (3) effecting said increase of the fuel quantity for a period of time after said transition has been detected and before a predetermined number of pulses of said predetermined control signal are generated, so long as it is determined in said step (2) that said detected magnitude of variation is larger than said predetermined value.

4,508,088

METHOD FOR CONTROLLING FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE AFTER TERMINATION OF FUEL CUT

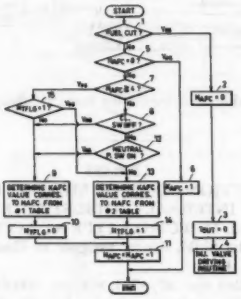
Shumpei Hasegawa, Niiza, and Noriyuki Kishi, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1983, Ser. No. 523,680

Claims priority, application Japan, Aug. 20, 1982, 57-143457

Int. Cl.³ F02D *5/00*

U.S. Cl. 123—493 **6 Claims**



1. A method of controlling the quantity of fuel being supplied to an internal combustion engine for a vehicle having wheels and a power transmission means for transmitting torque from said engine to said wheels of said vehicle, after termination of a fuel cut operation of said engine which is effected at deceleration of said engine, to desired values by increasing the fuel quantity by the use of fuel increments set in synchronism with generation of pulses of a predetermined control signal which are generated at predetermined crank angle positions of said engine, the method comprising the steps of: (1) setting beforehand a plurality of groups of fuel increments which have different fuel quantity increasing characteristics from each other; (2) determining whether or not there occurs a transition of the operative state of said engine from said fuel cut operation wherein fuel supply is cut off to a normal operation wherein fuel supply is effected; (3) determining whether said power transmission means is in a first state enabling transmission of torque from said engine to said wheels of said vehicle or in a second state disabling said transmission, for a period of time after the occurrence of said transition has been determined and before a predetermined number of said pulses of said predetermined control signal are generated; (4) selecting one of said plurality of groups of fuel increments corresponding to a state of said power transmission means determined in said step (3); and (5) effecting said increasing of the fuel quantity by the use of the selected group of fuel increments.

4,508,089

METHOD OF REGULATING THE CHARGE OF COMBUSTION GAS DELIVERED TO AN INTERNAL COMBUSTION ENGINE

Hans Baumgartner, Viersen, and Rainer Südbeck, Duisburg, both of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co. KG, Neuss, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,551

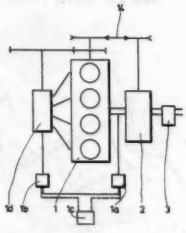
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144712

Int. Cl.³ F02D *23/02;* **F02B** *33/36*

U.S. Cl. 123—559 **3 Claims**

1. A method of regulating the supply of combustion fluid to an internal combustion engine from a positive displacement device capable of operating as a fluid motor or a fluid compressor, varying the rate of flow of the combustion fluid depending

on the desired change of load in the internal combustion engine, utilizing a control device for the positive displacement device operating as a fluid motor for varying the rate of flow, coupling the internal combustion engine in a force-locking manner with the positive displacement device, feeding fluid to the positive displacement device in unthrottled suction lines and subsequently, at least partially, displacing the fluid in an



unthrottled connecting line to the internal combustion engine, wherein the improvement comprises in the partial load range of the combustion engine feeding the fluid to the positive displacement device operating as a fluid motor in the unthrottled suction lines at a higher pressure than the displacing pressure out of the positive displacement device in the unthrottled connecting line for flow into the internal combustion engine.

4,508,090

METHOD AND APPARATUS FOR CONTROLLING THE SUPERCHARGER OF AN INTERNAL COMBUSTION ENGINE

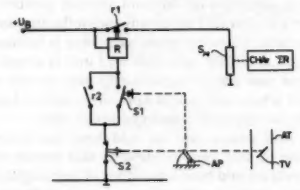
Helmut Rembold, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 549,185

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3241024

Int. Cl.³ F02D *23/00*

U.S. Cl. 123—564 **10 Claims**



1. Method of controlling the charger of an internal combustion engine of a motor vehicle as required wherein the engine has a first characteristic curve of torque vs. rotational speed (rpm) indicative of full-load engine operation with the charger switched out and a second characteristic curve of torque vs. rotational speed (rpm) defining the condition at which the charger is about to be switched out, the method comprising the steps of:

switching in the charger when the engine is operating at full-load to increase the torque delivered by the engine beyond that indicated by said first characteristic curve;

holding the charger in its switched-in condition while simultaneously reducing the torque delivered by the engine to a lower value of torque where said second characteristic curve and said first characteristic curve correspond to each other within at least a range of higher values of rpm; and,

switching out said charger directly after the torque has been reduced to said lower value thereof so that the engine again operates without the charger.

5. Apparatus for controlling the charger of an internal combustion engine of a motor vehicle as required by the operator of the vehicle, the engine having a first characteristic curve of torque vs. rotational speed (rpm) indicative of full-load engine operation with charger switched out and a second characteristic curve of torque vs. rotational speed (rpm) defining the condition at which the charger is about to be switched out, the apparatus comprising:

charger actuating means coupled to said charger for switching the charger in and out of the air supply system of the internal combustion engine;

first switch means for energizing said actuating means and switching in the charger when the engine is operating at full-load to increase the torque delivered by the engine beyond that indicated by said first characteristic curve;

torque adjustment means for reducing the torque delivered by the engine to a lower value of torque whereat said first and second characteristic curves correspond to each other at least within a range of higher values of rpm;

self-holding means for holding said actuating means in the energized condition while reducing the torque delivered by the engine to said lower value thereof; and,

second switch means connected to said torque adjustment means so as to be actuable when said lower value of torque is reached for releasing said self-holding means thereby causing said actuating means to become deenergized to switch out the charger.

4,508,091

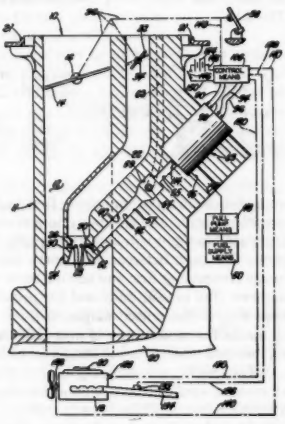
FUEL METERING APPARATUS WITH MULTI-STAGE FUEL METERING VALVE ASSEMBLY

Russell J. Wakeman, Novi, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.

Division of Ser. No. 88,361, Oct. 26, 1979, Pat. No. 4,342,443. This application Mar. 4, 1982, Ser. No. 354,876

Int. Cl.³ F02M *51/06*; B05B *1/30*

U.S. Cl. 123—586 **5 Claims**



1. Fuel metering apparatus for supplying metered rates of fuel flow to a combustion engine, comprising body means, induction passage means formed through said body means for supplying motive fluid to said engine, said induction passage means comprising primary induction passage means and main induction passage means, said main induction passage means comprising first inlet means for permitting the inlet of air and first outlet means for discharging motive fluid to said engine, main throttle valve means for variably controlling the rate of flow of air into said first inlet means and through said main

induction passage means, said primary induction passage means comprising second inlet means for permitting the inlet of air and second outlet means for discharging motive fluid to said engine, primary throttle valve means for variably controlling the flow of air through said primary induction passage means, said second outlet means comprising sonic venturi discharge nozzle means situated generally in said main induction passage means downstream of said main throttle valve means, a metering valving assembly for metering liquid fuel in response to engine demands and indicia of engine operation, and metered fuel conduit means communicating between said metering valving assembly and said sonic venturi discharge nozzle means, said metering valving assembly comprising metering orifice means, a cooperating metering valve member, first solenoid coil means effective upon being energized and de-energized to cause said metering valve member to move away from and toward said metering orifice means, movable abutment means, and second solenoid coil means, said second solenoid coil means being effective upon being energized to move said abutment means to a selected position to limit the movement of said metering valve member away from said metering orifice means, and a contoured extension of said metering valve member extending into said metering orifice means as to define an effective metering area therebetween, said contoured extension occupying more space within said metering orifice means the lesser the distance said metering valve member travels away from said metering orifice means.

4,508,092

MAGNETIC SENSOR FOR DISTRIBUTORLESS IGNITION SYSTEM AND POSITION SENSING

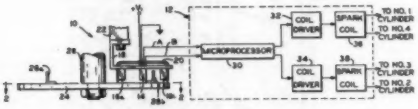
Ronald J. Kiess, Decatur, and Gary R. Nichols, Woodburn, both of Ind., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Continuation of Ser. No. 223,778, Jan. 9, 1981, Pat. No. 4,406,272, which is a continuation-in-part of Ser. No. 105,697, Dec. 20, 1979, abandoned. This application May 16, 1983, Ser. No. 492,947

The portion of the term of this patent subsequent to Sep. 27, 2000, has been disclaimed.

Int. Cl.[3] **F02P** *3/06, 1/00, 3/02;* **G08B** *21/00*

U.S. Cl. 123—617 **11 Claims**



1. Apparatus for use in a system having first and second parts that are movable relative one another comprising:

magnetic means having north and south poles for providing a magnetic flux path between said north and south poles;

sensor means comprising first and second sensors for sensing the magnetic flux in said path and for providing a signal corresponding to the sensed magnetic flux;

mounting means for mounting said magnetic means and said first and second sensors in substantially rectilinear alignment; said magnetic means being between said first and second sensors; said first and second sensors being intersected by a line through said north and south poles; said line being substantially parallel to said flux path at said north and south poles; said first sensor being linearly spaced on said line from said magnetic means south pole to form a first open region linearly defined along said line between said first sensor and said magnetic means south pole; said second sensor being linearly spaced on said line from said magnetic means north pole to form a second open region linearly defined along said line between said magnetic means north pole and said second sensor; whereby there is provided a predetermined flux concentration in said first and second open regions and whereby said first and second open regions provide dual information sensing regions.

4,508,093

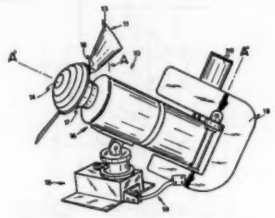
TARGET-PIGEON LAUNCHER

Millo Bertini, 679 Garden St., Trumbull, Conn. 06611

Continuation-in-part of Ser. No. 129,259, Mar. 11, 1980, abandoned. This application Mar. 3, 1981, Ser. No. 239,972

Int. Cl.[3] **F41B** *15/00*

U.S. Cl. 124—1 **23 Claims**



1. In combination with a target pigeon having a hub and a pair of propeller-type wings extending oppositely from said hub, a launcher comprising:

a drive unit including a motor and having an output shaft rotatable about a shaft axis;

a base underneath said unit and provided with mounting means for securing said unit to said base for permitting swiveling of said unit on said base about an upright swivel axis with said shaft axis transverse to said swivel axis;

a head fixed on said shaft and fittable with said hub;

retaining means for releasably securing said hub to said head with said wings extending radially from said shaft axis;

control means connected to said unit and to said retaining means for energizing said unit with said pigeon retained on said head for spinning said pigeon and thereby generating an axially backwardly flowing airstream;

a vane on said unit axially behind said head in said stream and pivotal about an upright vane axis between one end position inclined in one direction across said airstream and deflecting same to one side and another position inclined oppositely across said airstream and deflecting same to the opposite side, whereby when said vane is inclined in said one direction to said airstream said unit is urged rotationally about said swivel axis on said base in one rotational sense and when said vane is oppositely inclined said unit is urged in the opposite rotational sense; and

means on said motor and on said base for reversing the inclination of said vane relative to said stream when said unit swivels on said base into either of two angularly offset reversing positions, whereby said unit with said pigeon will oscillate between said reversing positions.

4,508,094

CONVERTIBLE COOKING UNIT

Paul W. Hait, Saratoga, Calif., assignor to Pyromid, Inc., Los Gatos, Calif.

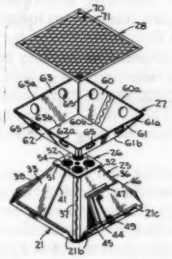
Filed Nov. 12, 1982, Ser. No. 440,984

Int. Cl.[3] **F24C** *1/16*

U.S. Cl. 126—9 R **14 Claims**

1. A cooking unit comprising an open-ended support member of truncated pyramidal configuration, an open-ended firebox of truncated pyramidal configuration disposed in axial alignment with said support member and having the smaller end of said firebox projecting through the opening in the smaller end of said support member, at times said support member is inverted and is positionable over said firebox with the smaller end of said firebox projecting through the opening in the smaller end of said support member, said support mem-

ber and said firebox being formed with a larger end, said support member and said firebox being of a configuration and dimensions for overlapping support, and a grill positionable over the larger upper end of said support member when the unit is oriented with said support member above said firebox, and said grill being positionable over the larger upper end of said firebox when the unit is oriented with said firebox disposed above said support member, said support member comprising panels having trapezoidal configurations and adjacent, non-parallel edges of said panels being hingedly connected for folding and extending said support member, and wherein said firebox comprises panels having trapezoidal configurations and adjacent, non-parallel edges of said panels of said firebox being hingedly connected for folding and extending said firebox.

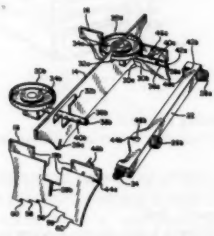


4,508,095

COLLAPSIBLE PORTABLE STOVE AND CARRYING CASE THEREFOR

Bradley A. Bloechel, 6326 SE. 67th Ave., Portland, Oreg. 97206

Filed May 17, 1983, Ser. No. 495,507
Int. Cl.³ F24C 1/16
U.S. Cl. 126—9 R **10 Claims**



3. A collapsible stove having burner means and having fuel distribution means arranged to be connected between said burner means and a source of fuel, said burner means having a first cross-section and a second cross-section, said second cross-section being at a more-or-less substantial angle to said first cross-section and said fuel distribution means incorporating fuel control means for said burner means, consisting essentially of:

a. a first member having a first upper edge, said first member incorporating therein an aperture corresponding more-or-less to said first cross-section, and having a first assembly slot extending partially transversely therethrough toward said first upper edge;

b. a second member having a second upper edge and having therein a second assembly slot adapted to be matingly received by said first assembly slot and extending partially transversely therethrough away from said second edge, said second member having in said second upper edge a shaped cutout corresponding more-or-less to said second cross-section;

c. portions of said first upper edge and said second upper edge defining a plane when said first member and said second member are matingly assembled; and

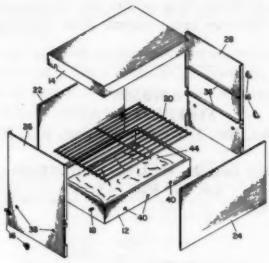
d. assembly means on said first and said second upper edges being adapted to receive said fuel distribution means and maintain same in spaced relationship with said burner means when said first and said second members are matingly assembled.

4,508,096

COMPACT VERSATILE PORTABLE COOKER

Walter T. Slattery, 3439-½ Altura Ave., La Crescenta, Calif. 91214

Filed Aug. 22, 1983, Ser. No. 525,561
Int. Cl.³ F24C 1/16
U.S. Cl. 126—9 R **6 Claims**



1. A compact versatile portable cooker comprising:

a fire pan of rectangular configuration and having a bottom and four sides;

a cover;

a pair of supporting end plates, said end plates being small enough to fit into said fire pan;

an open rectangular grill member;

means for alternatively securing said cover or said end plates to said fire pan, to provide with said cover a closed container for containing and storing all of the parts of the portable cooker; and to provide with said end plates a support for said grill above the fire pan and with the fire pan raised above the ground or other supporting surface; and

said end plates including means for supporting said grill member at several different cooking levels above said fire pan, and said end support plates further including inturned flanges for holding said front and rear side plates in place.

4,508,097

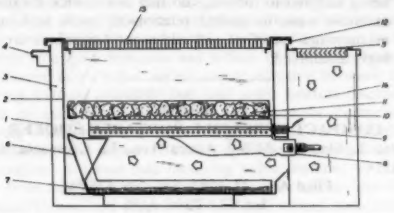
SELF CLEANING INDOOR BARBECUE GRILLER

Keith E. Berg, 42 Weir Crescent, Lurnea NSW 2170, Australia

PCT No. PCT/AU82/00057, § 371 Date Dec. 8, 1982, § 102(e) Date Dec. 8, 1982, PCT Pub. No. WO82/03544, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 13, 1982, Ser. No. 448,899
Claims priority, application Australia, Apr. 10, 1981, PE8409
Int. Cl.³ F24C 3/00
U.S. Cl. 126—41 R **14 Claims**

4. A cooking appliance comprising an outer casing, an enclosure spaced inwardly of said outer casing, a layer of thermal insulation sandwiched between said outer casing and said enclosure, a horizontal cooking surface forming the top of said enclosure and having at least one vent therein, radiant heating means spanning across said enclosure at a level beneath said cooking surface, said heating means including means porous to liquid fat dropping thereon from the cooking surface, a tray

supported beneath said heating means and towards which liquid fat drops when falling from the heating means, a layer of fat-absorbent and substantially heat-impervious material on said tray, and an inlet permitting combustion air to enter said



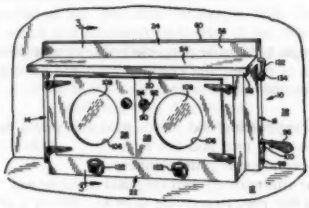
enclosure beneath the heating means, said appliance operating by generating sufficient heat within the vicinity of the absorbent layer to vaporize and combust food material deposited thereon.

4,508,098

FIREPLACE CAP

Philip E. Scheler, Rte. 1, Western Heights, #12, Baker, Oreg. 97814

Filed Dec. 21, 1982, Ser. No. 452,025
Int. Cl.³ F24C *15/04*
U.S. Cl. 126—139 **16 Claims**



1. A fireplace cap for a fireplace with a fire box and fireplace opening leading to the fire box comprising:

an upright, rectangular frame means including first and second plural stepped side rail members, a lower damper section, and an upper header section, said frame means defining a fireplace cap opening and being adapted for mounting to the front of a fireplace so as to permit insertion of fuel through the cap and fireplace openings and into the fire box of the fireplace, each of said side rail members including a first step adjacent to the fireplace opening and a second step adjacent to the first step, the first step being of shallower depth than the second step;

at least one hinged door mounted to said frame means and movable from a first position closing the cap opening to second positions opening the cap opening; and

latching means for holding said door in a closed position.

5. A fireplace cap for a fireplace with a damper, a fire box, and a fireplace opening leading to the fire box comprising:

an upright, rectangular frame means including first and second side rail members, a lower damper section, and an upper header section, said frame means defining a fireplace cap opening and being adapted for mounting to the front of the fireplace so as to permit insertion of fuel through the cap and fireplace openings and into the fire box of the fireplace;

at least one hinged door mounted to said frame means and movable from a first position closing the cap opening to a second position opening the cap opening; and

latching means for holding said door in a closed position, said latching means including actuator means pivotally mounted to said door at a location above the center of the door, a first latching arm means eccentrically mounted to said actuator means and extending upwardly therefrom, a second latching arm means eccentrically mounted to said actuator means and extending downwardly therefrom, said second latching arm means being longer than said first latching arm means first guide means for receiving and guiding the motion of said first latching arm means, second guide means for receiving and guiding the motion of said second latching arm means, said header section defining an upper latching arm receiving opening, said damper section defining a lower latching arm receiving opening; and

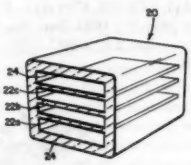
handle means for pivoting said actuator means in a first direction to extend said first latching arm means into the upper latching arm receiving opening and said second latching arm means into the lower latching arm receiving opening so as to latch the door in a closed position, and for pivoting the latching arms in a second direction to retract the latching arms from the respective latching arm receiving opening and permit the door to open.

4,508,099

SOLAR FURNACE

Philippe A. Clavier, 1880 Century Park East, Suite 500, Los Angeles, Calif. 90067

Filed Feb. 22, 1982, Ser. No. 351,018
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—400 **1 Claim**



1. An insulating element including:

walls of an insulating material defining an evacuated interior space,

a plurality of reflective panels having an uncovered surface with reflective properties extending entirely across the interior space, and

a plurality of black body panels having an uncovered surface with black body properties extending entirely across the interior space, generally parallel to the reflective panels, said reflective panels and surfaces and said black body panels and surfaces alternating within the interior space, and being spaced apart from one another except where they are attached to said wall.

4,508,100

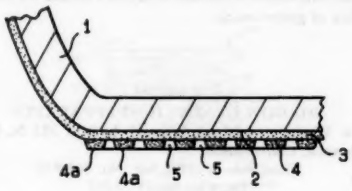
METHOD FOR ENAMELING THE BOTTOM FACE OF A CULINARY VESSEL OF ALUMINUM OR ALUMINUM ALLOY AND A CULINARY VESSEL OBTAINED IN ACCORDANCE WITH SAID METHOD

Jean-Pierre Deville, La Balme de Sillingy, France, assignor to Seb S.A., Selongey, France

Filed Jun. 10, 1983, Ser. No. 502,952
Claims priority, application France, Apr. 15, 1983, 83 06178
Int. Cl.³ A47J *27/00*
U.S. Cl. 126—390 **3 Claims**

1. A method for enameling the bottom face of a culinary vessel of aluminum or aluminum alloy which comprises apply-

ing on said bottom face an enamel slip coating of a conventional type for aluminum or aluminum alloy, heating said layer of enamel slip to a temperature within the range of 50° to 95° C. during a sufficient period of time to reduce the moisture content to a value within the range of 0.5 to 10% by weight,



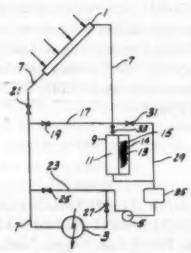
applying a second layer of enamel slip containing between 15 to 40% by weight of hardening agents in the form of fine particles on the first layer of enamel slip before the temperature of said first layer has fallen to a value below about 45° C., and firing said two layers in order to sinter the enamels contained in said layers.

4,508,101

THERMAL ENERGY STORAGE SYSTEM

Don E. Carter, and Henry K. Yuen, both of Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 9, 1982, Ser. No. 366,794
Int. Cl.³ F24J 3/02
U.S. Cl. 126—436 **41 Claims**



40. A composition adapted for use in active or passive thermal energy storage system comprising a phase change material and a nucleating agent therefor, said phase change material being selected from the group consisting of aliphatic diamines having the general formula

$$H_2N—(CH_2)_n—NH_2,$$

where n is an integer between 4 and 14 inclusive, bis(hexamethylene)triamine, 3-aminobutylcyclohexylamine, p-phenylenediamine, mixtures of said amines with each other, mixtures containing at least one of said amines and water and mixtures containing at least one of said amines and an agent for lowering the melting point thereof.

4,508,102

HEAT COLLECTION, DISSIPATION AND STORAGE

Ira V. Hager, P.O. Box 5845, Hilton Head Island, S.C. 29928

Filed Sep. 5, 1980, Ser. No. 184,194
Int. Cl.³ F24J 3/02
U.S. Cl. 126—437 **2 Claims**

1. A roofing system comprising:

a support sheet;

an edge means surrounding said support sheet around the circumference thereof, and upstanding from said support sheet;

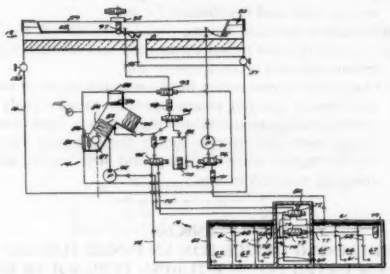
means for defining a substantially water and air-tight volume within the volume defined by said support sheet and upstanding edge means, said volume-defining means consisting of: a first water and air impermeable membrane abutting said support sheet and said edge means, and overlapping said edge means; a second water and air impermeable membrane disposed above said first membrane, generally coextensive therewith; and means for affixing overlapping portions of said first and second membranes to said edge means around the outer periphery thereof to define a substantially liquid and air-tight volume between said membranes;

valve means for providing exhausting of air from between said membranes during filling of the volume between said membranes with liquid;

means defining a liquid outlet from the volume between said membranes;

means defining a liquid inlet into the volume between said membranes;

underlying building components for supporting said support sheet so that it has a slight slope inwardly from said edge means to define a low drain point adjacent the center of said support sheet;



said means defining an inlet to between said membranes is located outwardly spaced from said low drain point, adjacent a portion of said edge means; and

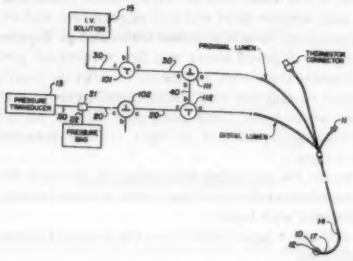
in combination with a building on which said roofing system is mounted, and including liquid conduit and circuitry means cooperating with said inlet and said outlet for supplying liquid to and draining liquid from the volume between said membranes, said liquid conduit and circuitry means comprising: a main liquid storage tank; a secondary liquid storage tank; heat exchange means for providing for heat exchange between liquid circulating in said conduit and circuitry means to ambient air in the building; pipe means interconnecting said inlet, outlet, tanks, and heat exchange means; sensor means for sensing the temperature in the volume between said membranes, said storage tanks, said outlet, and the ambient air in the building; first pump means for pumping liquid through said heat exchange means from said main storage tank; second pump means for pumping liquid from one of said tanks into said inlet between said membranes; valve means disposed in said pipe means between said inlet, outlet, tanks, pump means, and heat exchange means, for valving liquid flow to various of the components; and electrical control means for controlling said pump means and valve means in response to the temperature of the sensed liquid within the various volumes being sensed, and depending upon the sensed air temperature within the building.

4,508,103

PRESSURE MONITORING INTERCONNECT SYSTEM

Constance M. Calisi, 5518 Martel, Dallas, Tex. 75206

Filed Sep. 6, 1983, Ser. No. 529,382
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—673 **6 Claims**



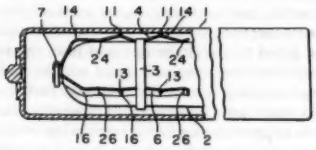
1. Fluid pressure monitoring apparatus comprising:
(a) a catheter including at least a first lumen having an opening at a first location and a second lumen having an opening at a second spaced apart location on said catheter;
(b) pressure measuring means;
(c) first conduit means connecting said pressure-measuring means with said first lumen;
(d) solution injection means;
(e) second conduit means connecting said solution injection means and said second lumen; and
(f) valve and bypass means interconnected between said first and second conduit means operable to selectively interconnect said pressure-measuring means in fluid communication with said second lumen through said valve and bypass means while isolating said first lumen and said solution injection means.

4,508,104

RETAINING DEVICE FOR AN INNER TUBE OF AN EVACUATED DOUBLE-TUBING TYPE SOLAR HEAT COLLECTOR

Hirosato Takeuchi, and Toshio Mikiya, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,142
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—443 **3 Claims**



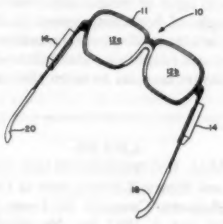
1. A retaining device for an inner tube of an evacuated double-tubing type solar heat collector comprising:
a ring having an inner diameter approximately equal to the outer diameter of the inner tube and adapted to be positioned around the outer periphery of the inner tube; and
at least three leaf springs extending generally longitudinally of the inner and outer tubes of the collector and circumferentially equally spaced apart from each other, each of the leaf springs being made of a narrow metal strip bent into a corrugated or gentle sawtooth shape and having first portions for contacting the inner surface of the outer tube formed at the bent crest portions and second portions for contacting the outer surface of the inner tube formed at the bent trough portions, each of the leaf springs being fixed adjacent one of its trough portions to said ring at right angles relative to the diameter of the ring, and said leaf springs being bent adjacent one end inwardly toward the center of the inner tube and convergingly toward each other and being formed at said one end with hooked portions which cooperate to define a holder for an annular ring of getter metal.

4,508,105

SHADOW GENERATING APPARATUS

Glen A. Whitten, and Lech Pisarski, both of 353 N. Oak St., Inglewood, Calif. 90302

Filed Feb. 8, 1983, Ser. No. 464,970
Int. Cl.³ A61M *21/00*
U.S. Cl. 128—1 C **8 Claims**



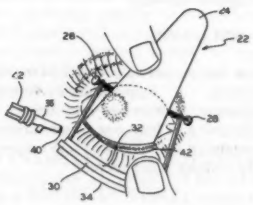
1. A shadow generating apparatus, comprising:
a viewing apparatus;
at least a lens fitted to said viewing apparatus, each said lens having disposed therein a liquid crystal display;
a timing mechanism connected to said liquid crystal; and
a power source for said timing mechanism; wherein said timing mechanism intermittently activates and deactivates said liquid crystal.

4,508,106

MICROSURGICAL METHOD FOR APPLYING PERMANENT EYELID LINER

Giora G. Angres, North Las Vegas, Nev., assignor to Angres Clinic, Ltd., North Las Vegas, Nev.

Continuation-in-part of Ser. No. 454,176, Feb. 14, 1983, abandoned. This application Oct. 24, 1983, Ser. No. 545,114
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—1 R **7 Claims**



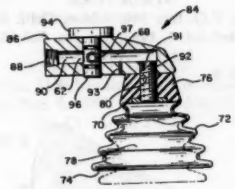
1. A method of applying a permanent cosmetic liner to the edge of an eye lid comprising the steps of anesthetizing the portion of the eye lid in the area adjacent the edge of said eye lid; stabilizing the portion of the eye lid to which said liner is to be applied; penetrating the skin with pigment solution along a line on the eye lid defining the intended location of said liner.

4,508,107

PNEUMATIC PERCUSSOR

Larry O. Strom, Fort Davis, and Betty S. Guex, Dallas, both of Tex., assignors to Strom Corporation, Dallas, Tex.

Filed Sep. 13, 1982, Ser. No. 417,602
Int. Cl.³ A61H *7/00*
U.S. Cl. 128—54 **3 Claims**



1. An apparatus for stimulating expectoration of mucus from the lungs, comprising:

a sealed chamber having expandable resilient side and bottom walls to facilitate expansion, said chamber having an orifice in the surface thereof, and said chamber including rigid supporting structure disposed to constrain said side wall at an end thereof such that said side and bottom walls are uniformly free to flex in response to changes in air pressure within the chamber;

a pressurized air source;

means for regulating the air flow through the orifice in said chamber;

an air tube having one end connected to said means for regulating;

means for periodically connecting and disconnecting said pressurized air source to the other end of said air tube;

means for exhausting the air from said air tube such that said means for exhausting reduces the pressure within said air tube when said pressurized air source is connected and exhausting air within said chamber when said pressurized air source is not connected wherein said sealed chamber expands and contracts thereby producing a rhythmic movement to the lungs; and

said means for periodically connecting comprising:

a pneumatically operated toggle valve controlled from said pressurized air source for toggling a linkage; and

a three-way valve controlled by said linkage having the input thereof connected to said pressurized air source, one output thereof connected to said air tube and the other output thereof connected to a muffler.

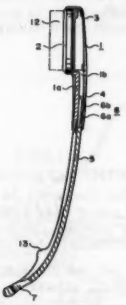
4,508,108

ADJUSTABLE BODY BRUSH AND MASSAGER

Eikichi Miyaoka, 1-12-3 Nakajujo, Kita-ku, Tokyo 114, Japan

Filed Sep. 24, 1982, Ser. No. 423,235
Claims priority, application Japan, Sep. 28, 1981, 56-142533[U]
Int. Cl.³ A61H *9/00*
U.S. Cl. 128—65 **10 Claims**

1. A brush-massager device comprising a detachable disc support unit and a movably connecting handle means, said disc support unit having an internal tunnel running longitudinally through substantially the length of said unit, said tunnel adapted to receive and lock with said handle means, said tunnel having apertures at its upper and lower portions, said handle means having a spring-loaded button at substantially it supper terminal portion wherein said spring loaded button locks with said upper aperture in a first position and with said lower aperture in a second position, said disc support further comprising a face having raised flexible projections interspersed



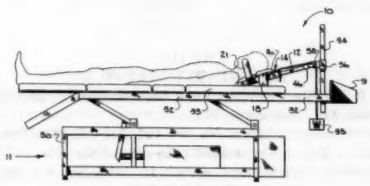
with a plurality of bristles, and said handle means adapted to slide into and out said tunnel in said disc support.

4,508,109

CERVICAL TRACTION DEVICE

Harold D. Saunders, 7116 Courtly Rd., Woodbury, Minn. 55125

Filed Jan. 11, 1982, Ser. No. 338,479
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—75 **10 Claims**



1. A cervical traction device for use on conventional traction tables with a dynamic traction mechanism including weights, ropes and pulleys anchored to one end of the table comprising:

a track means positioned longitudinally on the traction table and attached at one end to the traction mechanism;

a carriage slidably mounted on the track means including a head support pad and lateral extensions positioned below the support pad, the ropes of the traction mechanism being attached to the carriage whereby varying loads are applied to said carriage;

a pair of upwardly extending outwardly canted arms mounted on the lateral extensions of the carriage and adjustable laterally along said extensions and adapted to purchase on the occipital bone of a patient's head; and

a head band means attached to the carriage for holding the patient's head against the support pad of the carriage.

4,508,110

BODY JACKET

Michael D. Modglin, 3229 Timberline, Winter Haven, Fla. 33881

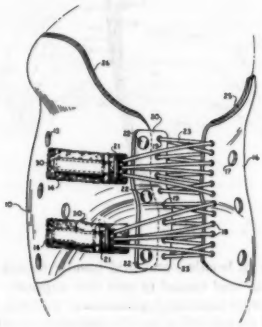
Filed Sep. 14, 1983, Ser. No. 531,847
Int. Cl.³ A61F *5/02*
U.S. Cl. 128—78 **8 Claims**

1. A rigid orthosis for limiting motion in the thoracic or lumbosacral areas of a human patient which can be easily donned and doffed by the patient comprising:

a substantially rigid body jacket having a patient-fitting anterior section, the lateral edges of which terminate in

the left and right anterolateral regions of the torso and a patient-fitting posterior section, the lateral edges of which terminate in the left and right posterolateral regions of the torso in spaced, opposing relationship to said anterior section lateral edges

a pair of elongate panels, each having attachment means for



selectively removably attaching one of said panels to each of the lateral edges of said anterior section;

lacing means for connecting each of said panels to a lateral edge of said posterior section; and

adjusting and attaching means for directly securing said lacing means to said anterior section during donning of said orthosis.

4,508,111

ADJUSTABLE SPLINT

George R. Hepburn, Severna Park, Md., assignor to Dynasplint Systems, Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 286,161, Jul. 23, 1981, Pat. No. 4,397,308, which is a continuation-in-part of Ser. No. 367,598, Apr. 12, 1982,. This application Apr. 13, 1983, Ser. No. 484,439

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—87 R **24 Claims**

1. An adjustable splint assembly comprising a lower strut and an upper strut pivotably connected to said lower strut, adjustable means for rotating one of said pivotably-connected struts relative to the other and for applying a quantifiable force tending to align or approximate said upper and lower struts, at least one of the struts being comprised of outer and inner telescoping portions, the outer telescoping portion being provided with a wire assembly for facilitating attachment of the splint assembly to the limb, said wire assembly comprising an upper wire portion and a lower wire portion, each of which extends subtantially the length of and is attaced to said outer telescoping portion, means for fixedly securing together said telescoping portions and means for securing said splint assembly to a limb.

4,508,112

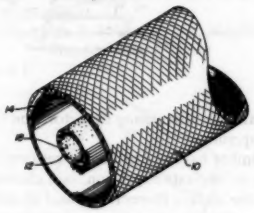
FLUID PRESSURE ACTUATED IMMOBILIZING STRUCTURE

C. Oliver Seeler, P.O. Box 246, Albion, Calif. 95410

Filed Jul. 1, 1983, Ser. No. 510,462

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—89 R **10 Claims**



1. A fluid pressure actuated immobilizing structure comprising:

a flexible, substantially nonexpandable outer container;

a pressure sensitive matrix material situated within said outer container, said matrix material adapted to permit relatively unhindered relative movement among the elements comprising said matrix material under normal conditions and to substantially inhibit relative movement among the matrix elements when the matrix elements are squeezed together; and

fluid pressurization means for squeezing said pressure sensitive matrix material thereby compressing said matrix material to lock the immobilizing structure into the shape existing immediately before pressurization.

4,508,113

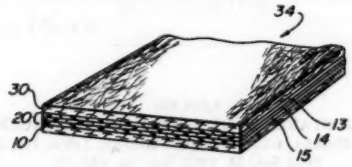
MICROFINE FIBER LAMINATE

Frank E. Malaney, Warren, N.J., assignor to Chicopee, New Brunswick, N.J.

Filed Mar. 9, 1984, Ser. No. 588,038

Int. Cl.³ A61F *13/00*; A61M *15/08*; B32B *27/00*; D04H *1/04*

U.S. Cl. 128—132 D **14 Claims**



1. A water impervious laminated material comprising an inner hydrophobic microfine fiber structure sandwiched between two layers of conjugate fibers, each of said layers of conjugate fibers having a first face and an opposite face, said conjugate fibers being composed of a lower melting component and a higher melting component, wherein a substantial proportion of the surfaces of said fibers comprises said lower melting component, said hydrophobic microfine fiber structure comprising a three-ply structure having an inner ply sandwiched between and bonded to two outer plies, each ply comprising a web of microfine fibers having a fiber diameter of up to 10 microns, said inner ply of said hydrophobic microfine

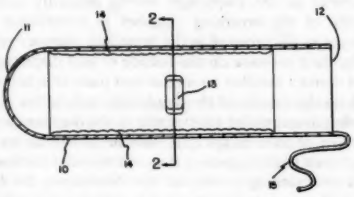
fiber structure having a melt temperature higher than the melt temperatures of each of said outer plies of said hydrophobic microfine fiber structure, said lower melting components of both layers of said conjugate fibers which lie on said first face having been fuse bonded to the adjacent outer plies of said hydrophobic microfine fiber structure at a temperature below the melt temperature of said higher melting component of said conjugate fibers, so that the latter component retains its initial fiber-like integrity.

4,508,114

ANTI-RAPE DEVICE

Anna G. Pennystone, 8150 Reading Rd., Cincinnati, Ohio 45237

Filed Sep. 8, 1983, Ser. No. 530,418
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—138 R **10 Claims**



1. An anti-rape device adapted to be worn in the vaginal cavity of a human female, comprising:

(a) a hollow housing dimensioned to be releasably received within the vagina, said housing being closed at one end and open at the other end; said housing being semi-pliable, but rigid enough not to collapse upon itself

(b) adhesive means on the inside walls of the hollow housing for securely adhering to the penis of a rapist during penetration of a vagina containing the anti-rape device; and

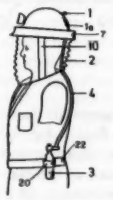
(c) an irritant-containing pouch positioned within the hollow housing, said pouch being made of a material which will rupture upon forceful contact with the rapist thereby releasing its contents.

4,508,115

PROTECTIVE BREATHING HOOD FOR ESCAPE PURPOSES

Ernst Warnecke, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk AG, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,567
Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220458
Int. Cl.³ A62B *7/00*
U.S. Cl. 128—201.23 **13 Claims**



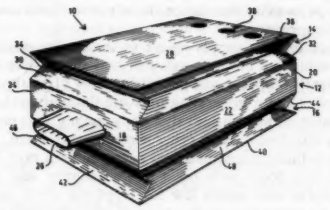
1. A protective breathing hood for escape purposes, comprising a head covering helmet having a periphery and an annular brim, extending laterally from said helmet periphery and terminating in an annular periphery a skirt portion extending downwardly from the annular periphery of said brim, an annular hood having an upper end connected to said helmet adjacent said helmet periphery and a remaining portion folded within the confines of said brim and said skirt portion around the wearer's head and below said brim, an annular cover disposed beneath and supporting said hood, and detachably connected to said skirt portion and means associated with said helmet hood to remove said cover and extend said hood downwardly to encircle the head of the wearer.

4,508,116

CARBON DIOXIDE REBREATHING APPARATUS

David T. Duncan; David M. Lipscomb, both of Knoxville; John McElligott, Oliver Springs, and Charles W. Williams, Powell, all of Tenn., assignors to Products for Health and Industry, Knoxville, Tenn.

Filed Dec. 28, 1982, Ser. No. 454,036
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—203.28 **17 Claims**



1. A rebreathing device for increasing the carbon dioxide concentration of air inhaled by a user, which comprises:

a first rectangular prism-shaped chamber of a selected volume defined by planar non-collapsible enclosure walls, and having side walls adjoined to a first end wall and a further end wall, and provided with a mouthpiece communicating therewith at said first end wall;

a second rectangular prism-shaped chamber, having a selected volume relative to said volume of said first chamber, defined by planar enclosure walls including side walls adjoined to a first and a further end wall and a common side wall with said first chamber, said common wall being provided with opening means adjacent said further end walls of said first and second chambers communicating between said first and second chambers;

a third rectangular prism-shaped chamber adapted for collapse when said device is not in use, having a selected volume relative to said first and second chambers, defined by planar collapsible and non-collapsible walls including collapsible opposed side walls adjoined to first and further collapsible end walls, and a common non-collapsible side wall with said second chamber and a non-collapsible wall opposed to said common wall, said common wall being provided with opening means adjacent said first end walls of said second and third chambers communicating between said second and third chambers, and said opposed non-collapsible wall being provided with opening means communicating with the atmosphere surrounding said device;

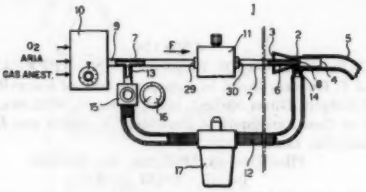
whereby said first, second and third chambers, and said openings communicating between said chambers, produce an extended restricted flow path along the additive lengths of said first, second and third chambers between said mouthpiece and said opening to the atmosphere thereby producing an accumulation of breath of a user with a corresponding accumulation of carbon dioxide in the device and in air inhaled by said user.

4,508,117

APPARATUS FOR ARTIFICIAL PULMONARY VENTILATION DURING ANAESTHESIA AND RESUSCITATION

Gianpiero S. Rodari, Bussero, Italy, assignor to Soxil S.p.A., Milan, Italy

Filed Sep. 13, 1982, Ser. No. 417,478
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—204.21 **2 Claims**



1. Apparatus for effecting gaseous transfer by diffusion for artificial pulmonary ventilation during anaesthesia and resuscitation, comprising:

a supply line for supplying air to the lungs; an alternately openable and closable valve in said supply line for intermittently stopping and permitting flow of air through said supply line for generating pressure fluctuations in said air;

said valve comprising a valve body having two parts rotatably attached to each other about a central axis, a shutter seat defined across said two parts, an inlet port in one of said two body parts open to said shutter seat and connected to said supply line for supplying air to said valve, and an outlet port in the other of said two body parts and open to said shutter seat for releasing air from said valve;

a shutter rotatably mounted in said valve body about said central axis and sealingly engaged with said two parts across said shutter seat for closing said inlet and outlet ports;

a variable speed electric motor including means for rotating said shutter over said seat;

at least one duct in said shutter for intermittently connecting said inlet and outlet ports for permitting flow of air through said valve; and

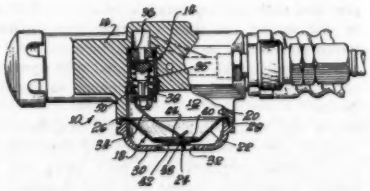
means for adjusting the relative angular positions of said first and second body parts and said inlet and outlet ports about the axis of rotation of said shutter for adjusting the frequency of said fluctuations and the period during which air is permitted to flow through said valve to the lungs.

4,508,118

DIAPHRAGM ASSEMBLY FOR SCUBA DIVING REGULATOR

Douglas J. Toth, Long Beach, Calif., assignor to Under Sea Industries, Inc., Rancho Dominguez, Calif.

Filed May 4, 1983, Ser. No. 491,373
Int. Cl.³ A62B *7/04*
U.S. Cl. 128—204.26 **1 Claim**



1. For a second stage scuba regulator having a body defining a breathing chamber having outlet means from which the scuba diver can draw air and an opening, said regulator including a demand valve in said body provided with an actuator arm movable in said breathing chamber in a direction having a component normal to and inwardly of the central region of said opening in the regulator body to open said demand valve, the improvement comprising:

(a) a diaphragm assembly including a diaphragm and a contact member;

(b) said diaphragm closing said regulator body opening and having a circular aperture at its central portion;

(c) means clamping the edge of said diaphragm to said body about said opening;

(d) said contact member having a configuration substantially as an axially thin spool made of low friction material, said spool having a circular neck fitting said circular aperture of said diaphragm, and having a contact plate on the inside of the diaphragm providing a flat surface along which the end of said actuator arm slides for continuous contact therewith as the diaphragm moves inwardly and outwardly of the breathing chamber in accordance with changes in gas pressure in the breathing chamber relative to the fluid pressure on the outside of said diaphragm;

(e) said contact member having an end plate attached to the neck on the outside of the diaphragm to hold the contact member in assembled relationship to the diaphragm at the aperture of said diaphragm, said neck having an axial length just slightly greater than the nominal thickness of the corresponding portion of the diaphragm, the fit between the contact member and the diaphragm being the sole means for maintaining them assembled whereby said diaphragm is free to creep to avoid localized stresses on said diaphragm and whereby the line of contact of the actuator arm with said flat surface changes when said creep occurs.

4,508,119

NEEDLE

Kenkichi Tukamoto, No. 462-1, Ohaza taki, Fujiwara-machi, Shioya-gun, Tochigi-ken, Japan

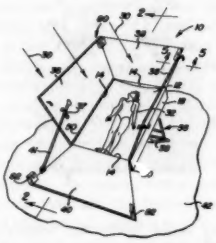
Continuation of Ser. No. 162,832, Jun. 25, 1980, abandoned, which is a continuation of Ser. No. 857,914, Dec. 6, 1977, abandoned. This application Nov. 2, 1981, Ser. No. 317,267
Claims priority, application Japan, Dec. 11, 1976, 51-149008
Int. Cl.³ A61B *17/34*
U.S. Cl. 128—329 A **2 Claims**

1. A needle for acupuncture provided with both a structure in which a magnetic field is formed around the needle and a structure in which an electrostatic field is formed around the needle, a magnet is used as the material for forming the magnetic field and a combination of a corpuscular ray-emissive nuclide and a semiconductor substance is used as the material which is capable of inducing the electrostatic field, said magnet, nuclide and semiconductor substance being fixed at the head of the needle and said nuclide and semiconductor substance being masked in such a manner that the corpuscular ray does not leak out and wherein the masking is made by coating said corpuscular ray-emissive nuclide and said semiconductor substance with a plastic material selected from nylon, rayon, acetate, acryl, polyethylene, teflon and polyvinyl chloride.

4,508,120
SUNTAN BOOTH

Steve A. Hammond, Walnut Park Mobile Estates #5, Spearfish, S. Dak. 57783

Filed Sep. 15, 1982, Ser. No. 418,376
Int. Cl.[3] A61H *33/06*
U.S. Cl. 128—372 5 Claims

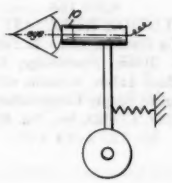


1. A collapsible solar energy suntan booth including a closed hollow enclosure of generally rectangular plan shape including opposite longitudinal side walls, opposite transverse end walls, a bottom wall extending and connected between the lower marginal portions of the side and end walls and a top wall defining solar energy absorbent collector plate extending and connected between the upper marginal portions of said side and end walls a pair of panel-shaped side extensions forming upward extensions of and hingedly supported from the upper marginal portions of said side walls for swinging between operative upwardly and outwardly inclined positions and collapsed positions closely overlying each other and said collector plate, a panel-shaped head end wall extension forming an upward extension of and hingedly supported from the upper marginal edge of one of said end walls enclosure for swinging between an operative upwardly projecting position extending between the adjacent ends of said side extensions when the latter are in their operative positions and a collapsed position closely overlying the adjacent ends of said side extensions when the latter are in the collapsed positions, and a panel-shaped foot and extension hingedly supported from the upper marginal portion of the other end wall of said enclosure for adjustable angular displacement between a lowered outwardly projecting position forming an endwise outward extension of said other end of said enclosure, an operative upwardly projecting position and a collapsed position closely overlying the adjacent ends of said side extensions when the latter are in their collapsed positions, releasable latch means connected between said side extensions and said head and foot end extensions operative to support said head and foot end extensions in the operative positions thereof when said side extensions are in their operative positions, said side extensions and foot and head end extensions, when in the operative position thereof, peripherally closing a dead air space therebetween above said enclosure, the surfaces of said extensions facing inwardly of said air space being of a dark solar energy absorbing color, said booth including base means underlying said enclosure and anchored relative thereto for supporting the latter in an inclined position from a generally horizontal surface and with said head end side uppermost, said foot end side, when in the lowered position thereof, defining a ramp leading upwardly into the interior of said booth, said foot end extension having one end of an elongated rod-type handle anchored relative thereto, one of said side extensions including guide means from which the other end of said handle is slidingly guided, said handle being operative by a person within said air space to selectively fully raise and lower said foot end extension, said latch means including a pair of coacting latch components mounted from each pair of adjacent side and end extension marginal edge portions and manually actuatable and releasable from both the inside and outside of said dead air space.

4,508,121
APPARATUS FOR MEASUREMENT OF CORNEAL THICKNESS

George H. Myers, Maplewood, N.J., assignor to Medsys, Inc., Rutherford, N.J.

Filed Aug. 8, 1983, Ser. No. 521,132
Int. Cl.[3] G01N *29/00*; A61B *5/04*
U.S. Cl. 128—639 6 Claims



1. Apparatus for the measurement of the thickness of the cornea comprising:

a piezo-electric transducer having a plurality of independent arcuate segments arranged in a circle to form a ring;

insulation means for electrically isolating each of said plurality of segments from the other;

acoustic means for acoustically isolating each of said plurality of segments from the other;

respective lead means connected to each of said plurality of segments for transmission of electrical signals;

a transmitter connected to said lead means for applying an electric signal to said plurality of segments to produce respective sound pulses;

respective receiver means connected to each of said lead means for converting the signal received from the associated segment into a distance measurement;

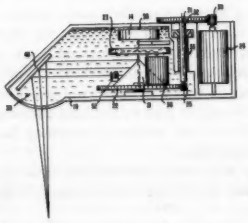
averaging means connected to all of said receiver means to average the distance measurements to thus indicate the distance measured at the center of said transducer; and

display means for displaying the average distance.

4,508,122
ULTRASONIC SCANNING APPARATUS AND TECHNIQUES

Bayard Gardineer, Skillman, and David Vilkomerson, Princeton, both of N.J., assignors to Ultramed, Inc., Princeton, N.J.

Filed Nov. 22, 1982, Ser. No. 443,488
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—660 19 Claims



1. An ultrasonic scanner apparatus for directing ultrasonic energy towards a body under investigation such as the body of a person, for producing scan image data indicative of the interior of said person's body, comprising;

a focussed ultrasonic transducer means for radiating a beam of ultrasonic energy in a given direction,

a rotating reflector having at least two different surfaces each of which intercepts a portion of said beam to reflect

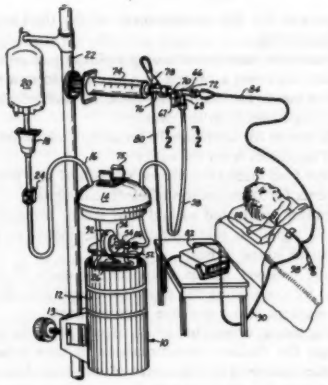
said intercepted energy in opposite directions said reflector rotating about an axis whereby said unidirectional rotation is manifested by no translational movement, means responsive to one of said reflected beams for scanning the said body under investigation whereby image data of the interior of said body as scanned is provided.

4,508,123

THERMODILUTION INJECTATE ASSEMBLY

Philip W. Wyatt, La Canada; Allen L. Newsome, Jr., Culver City; William G. Bloom, Northridge; Bernard Siegel, Los Angeles, and Michael Lubov, Arcadia, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 1, 1983, Ser. No. 499,938
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—692 **39 Claims**



1. An assembly for use in a thermodilution technique for measuring cardiac output, the assembly comprising:

(a) fluid introductory means for connecting the assembly to a source for fluid to be cooled and administered to a patient;

(b) an insulated container means for holding a heat exchange medium which can exchange heat with the fluid flowing through the assembly;

(c) a heat exchanger means positioned in the insulated container means having an inlet port in fluid-flow communication with the fluid introductory means and an outlet port with a closed fluid-flow path means extending between the inlet port and outlet port for providing a pathway for the fluid to be administered to the patient in heat exchange relationship with the heat exchange medium;

(d) a dual directional valve means in fluid-flow communication with the outlet port of the heat exchanger means for directing fluid to the patient or returning fluid to the fluid introductory means;

(e) a three-ported stopcock in fluid-flow communication with the dual directional valve means through one of the three ports;

(f) a syringe connected to one of the ports on the three-ported stopcock; and

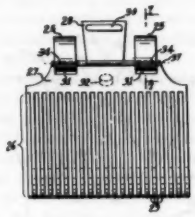
(g) fluid delivery means connected to a port on the three-ported stopcock for delivering fluid to a patient by connecting such fluid delivery means to a catheter which can be inserted in a patient for introducing fluid to the patient, which catheter includes temperature monitoring means for monitoring temperature in the circulatory system of the patient.

4,508,124

HAIR CURLING SPOOL HOLDER

Peter L. Franzino, 2556 Stein St., Jacksonville, Fla. 32216

Filed Aug. 24, 1983, Ser. No. 525,976
Int. Cl.³ A45D *2/26*
U.S. Cl. 132—41 R **14 Claims**



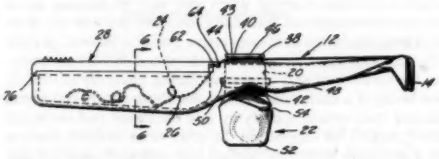
1. A hair curling spool holder for releasable attachment about a heatable cylindrical spool having a longitudinal axis and onto which hair is wrapped therearound with upstanding hair engaging nibs on its outer surface and an outwardly extending flange at each end, the improvement comprising a pair of identical mating half sections each having a finger grip portion, a body portion for encircling at least one-half of a spool, and an intermediate portion joining said body portion to said finger grip portion, said half sections being pivotal along a pivotal axis adjacent said finger grip portions to open and close said body portions along a longitudinal line parallel to a spool longitudinal axis to be respectively removed from or closely encircle a spool, said longitudinal line being closed adjacent an outer surface of a spool, said pivotal axis being parallel to said longitudinal line and a longitudinal axis of a spool and being spaced remote from an outer surface of a spool, each said section having a plurality of spaced, curved, flexible teeth extending from said longitudinal line to said intermediate portion, said sections when mated having said spaced teeth in interlocking relationship to provide lateral engagement therebetween to close said holder around a spool and to engage hair of a user without damage thereto whereby a spool with hair wrapped thereon is engaged by said holder and maintained in position on a head of a user.

4,508,125

DENTAL FLOSS APPLICATOR

Robert J. Loubier, 5122 Chippewa Ct., Fort Wayne, Ind. 46804

Filed Oct. 20, 1982, Ser. No. 435,619
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—92 R **5 Claims**



1. An improved dental floss applicator for use in dispensing and supporting a strand of dental floss under tension for cleaning teeth comprising an elongated supporting frame having on one end two laterally spaced furcations, tips on said furcations having floss-guiding portions by means of which a floss-strand may be tensioned therebetween, a handle portion on the other end of said frame, a cylindrically shaped capstan device mounted for rotation on said frame with supply and takeup capstan portions axially spaced thereon, the axis of said capstan device extending transversely to the longitudinal axis of said

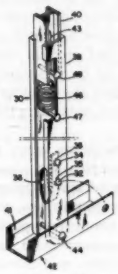
frame, said capstan device being disposed intermediate the opposite ends and said supply and takeup portions being on opposite sides, respectively, of said frame, said handle portion having a chamber therein which opens through the same side of said frame as said supply capstan portion, a cover mounted on said handle portion in covering relation with the opening of said chamber and slidable in opposite directions parallel to said longitudinal axis to open and close said opening, detent means interposed between said chamber and said capstan device for detachably securing said cover in closed position when said cover is moved in one longitudinal direction toward said capstan device, a supply of floss-strand in said chamber, said strand being threaded through said detent means, about said supply capstan portion, across said furcations, about said takeup capstan portion and then secured to said capstan device, said detent means retaining said cover in a chamber closing position and frictionally gripping said strand with sufficient force to resist without preventing strand movement through the detent so as to maintain the floss-strand on the supply capstan taut, and said threading being in a direction that as said capstan device is rotated in one direction said strand is tensed from said detent means, about said supply captan portion, across said furcations and about said takeup capstan portion.

4,508,126

RETRACTABLE AWNING FOR MOBILE DWELLINGS

Lloyd D. Everard, Kent, Wash., assignor to Valley Industries, Inc., Lodi, Calif.

Filed Jun. 1, 1982, Ser. No. 384,010
Int. Cl.³ E04F *10/06*
U.S. Cl. 135—89 **2 Claims**



2. An improved rafter bar for a retractable awning comprising:

a U-shaped channel having upstanding sides and outer and inner ends, said outer end pivotally mounted to the awning;

a box channel pivotally connected to said inner end of said U-shaped channel at a pivot position to move between extended and retracted relative orientations;

a dual button latching mechanism mounted to said box channel, said latching mechanism including a common spring to which a locking button and a releasing button are mounted at spaced apart positions, said buttons being at least partially external of said box channel; and

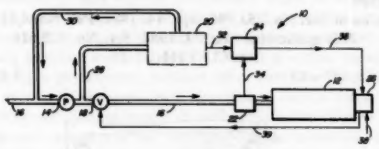
said buttons positioned so when said U-shaped channel and said box channel are in said extended relative orientation, said locking button engages a complementary locking recess in said U-shaped channel and said releasing button is free of overlying material so said releasing button is accessible by a user, whereby depressing said releasing button deflects said common spring to disengage said locking button from said locking recess to allow said U-shaped channel to be pivoted from said extended relative orientation toward said retracted relative orientation.

4,508,127

FUEL MASS FLOW MEASUREMENT AND CONTROL SYSTEM

John F. Thurston, Mesa, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 30, 1983, Ser. No. 480,554
Int. Cl.³ G05D *7/00*; G01F *1/90*; G01N *9/00*
U.S. Cl. 137—8 **16 Claims**



1. Apparatus for accurately measuring the density of a flowing fluid comprising:

(a) fluidic oscillator means having:

(1) power nozzle means for receiving a flow of fluid and converting the received fluid to a fluid jet, and

(2) means for utilizing the jet to create a pulsating pressure signal having a frequency indicative of the density of the received fluid; and

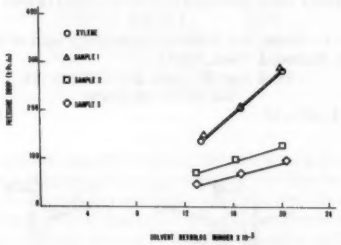
(b) means for maintaining the pressure drop across said power nozzle means essentially constant despite variations in the pressure of fluid received by said power nozzle means, whereby the frequency of said pulsating pressure signal is rendered substantially independent of the temperature, pressure and viscosity of the received fluid.

4,508,128

DRAG REDUCTION AGENT FOR HYDROCARBON LIQUID

Ralph M. Kowalik, Bridgewater; Ilan Duvdevani, Leonia; Dennis G. Peiffer, East Brunswick, and Robert D. Lundberg, Bridgewater, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 2, 1983, Ser. No. 547,909
Int. Cl.³ C08L *79/04, 81/08*; F17D *1/17*
U.S. Cl. 137—13 **2 Claims**



1. A process for decreasing the frictional drag of a hydrocarbon liquid flowing through a pipe or conduit having a continuous bore therethrough, which comprises the step of adding a polymer complex of an anionic polymer and a cationic polymer to said hydrocarbon liquid at a concentration level of about 0.001 to about 1.0 gram per 100 ml. of said hydrocarbon liquid, said cationic polymer being a styrene vinyl pyridine copolymer, said styrene vinyl pyridine copolymer containing about 0.5 to about 50 weight percent of vinyl pyridine, said anionic polymer being a neutralized sulfonated polymer having about 0.1 to about 25 mole percent sulfonate groups, said sulfonate groups being at least 50% neutralized with a transition metal ion, said sulfonated polymer having a molecular weight as measured by GPC of about 1,000 to about 10,000,000

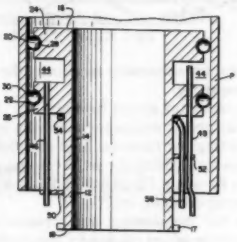
and said sulfonated polymer having a polymeric backbone selected from the group consisting of polystyrene, t-butylstyrene, ethylene propylene terpolymers, polyisobutylene, ethylene and polyisoprene.

4,508,129

PIPE REPAIR BYPASS SYSTEM

George T. Brown, P.O. Box 412, 255 Edge Ave., Valparaiso, Fla. 32580

Division of Ser. No. 253,906, Apr. 14, 1981, Pat. No. 4,413,655.
This application Sep. 28, 1982, Ser. No. 425,616
Int. Cl.[3] F16L *55/16*
U.S. Cl. 137—15 7 Claims



1. A method of welding a pipe joint in a pipe system for conveying a fluid, comprising the steps of:

locating a pipe repair bypass device, having a housing with a central passageway therethrough along a longitudinal axis and opening on opposite ends of the housing, within a pipe adjacent and upstream of an area to be worked;

coupling a conduit to a downstream end of the housing in fluid communication with the passageway;

expanding a first seal mounted on an exterior surface of the housing to form a first seal between the housing and pipe;

welding the pipe at a location downstream of the device; and

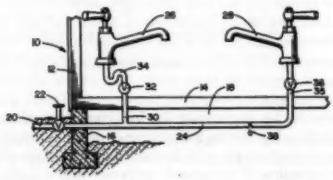
passing the pipe fluid through the passageway and conduit during welding of the pipe joint.

4,508,130

METHOD AND APPARATUS FOR REPAIRING WATER LEAKS

Robert L. Studer, and William E. Schourup, both of 16116 NE. 87th, Redmond, Wash. 98052

Filed Aug. 31, 1983, Ser. No. 528,721
Int. Cl.[3] F16K *43/00*
U.S. Cl. 137—15 15 Claims



1. A method of repairing a leak in a water distribution network of a plumbing system where there is:

(a) a distribution pipe having an upstream end and a downstream outlet end, and also having an outside surface of a predetermined outside diameter and an inside surface defining a passageway having a predetermined passageway diameter and passageway cross-sectional area;

(b) an existing shutoff valve located upstream of the upstream end of the distribution pipe;

said method comprising:

(a) determining a leak location of said leak;

(b) operating said existing shutoff valve to stop flow of water to said leak;

(c) selecting an intermediate isolation location in said distribution pipe downstream of said existing shutoff valve and upstream of said leak;

(d) cutting said distribution pipe at said isolation location to form first and second pipe end portions, both of which are substantially undistorted and provide substantially uninterrupted through passageway portions, without enclosing said isolation location in a watertight containment and with said isolation location being open to the surrounding environment;

(e) providing an isolation valve assembly comprising:

1. an isolation valve comprising:

(i) a main body portion defining a central through passageway section having a cross-sectional area at least as great as that of the pipe passageway;

(ii) a valve closure member having a first position closing said central through passageway section and a second position where said central through passageway section is substantially unobstructed;

(iii) a first connecting portion having an interior surface configured to engage an exterior surface of said first pipe portion in connecting relationship, and an exterior threaded surface portion;

(iv) a second connecting portion having an interior surface configured to engage an exterior surface of said second pipe portion in connecting relationship, and an exterior threaded surface portion;

(2) first and second compression nuts, each having an annular integral structure, with an inner threaded surface to engage the threaded surface portion of a related one of said connecting portions, and having a through opening to receive a related one of said pipe portions;

(3) first and second annular compression seal members, each adapted to be positioned around a related pipe portion in sealing engagement between a related one of said compression nuts and a related one of said connecting portions;

(f) inserting said isolation valve at said selected isolating location, with said first and second compression nuts and said first and second seal members being placed over said first and second pipe portions, respectively, and with said first and second connecting portions being around and in connecting engagement with said first and second pipe portions, respectively, and threading said nuts onto their respective connecting portions to bring said seal members in sealing relationship with the first and second pipe portions;

(g) closing said isolation valve;

(h) opening said existing shutoff valve;

(i) repairing said leak;

(j) opening said isolation valve to permit flow of water to said leak location.

4,508,131

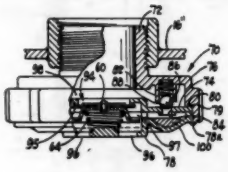
SAFETY VALVING FOR CARGO TANKS USED FOR BULK TRANSPORTATION OF HAZARDOUS COMMODITIES

Joseph H. DeFrees, deceased, late of Warren, Pa. (by Charles W. S. DeFrees, Barbara B. DeFrees, executors), assignor to Allegheny Valve Company, Warren, Pa.

Filed Dec. 13, 1982, Ser. No. 448,963
Int. Cl.[3] F16K *17/36*
U.S. Cl. 137—43 7 Claims

1. Safety valving for cargo tanks used for bulk transportation of hazardous commodities, such as for instance flammables, said valving providing automatic differential pressure relief as well as overturn protection comprising, a housing adapted for attachment to the upper portion of the tank, port means and in said housing adapted for communicating the interior of the

associated tank with the exterior, said differential pressure relief including first closure means coacting with certain of said port means and biased to closed condition but being operable to provide automatic differential pressure relief between the interior and exterior of said tank, and said overturn protection including angle responsive closure means responsive to predetermined angular orientation of said valving relative to the vertical and operative to close said valving against inadvertent escape of the tank's contents when the associated tank is in at least partially overturned position, said angle responsive closure means including downwardly converging side wall means on said housing adapted for guiding coaction with a movable closure member coacting with said side wall means and having side wall surfaces formed generally complementary to said side wall means, whereby said closure member is urged by gravity into closed postion relative to confronting of said port means if said valving is displaced into said predetermined angular orientation relative to said vertical, said differential pressure relief means comprising poppet valve means displaceable to open position when the differential fluid pressure between the interior and exterior of the associated tank exceeds a predetermined value, and wherein said valving includes a threaded head section for threading the valving into supporting structure of the tank, said housing including a plurality of circumferentially spaced wells receiving therein spring means and said first closure means including a plurality of ball elements coacting with a respective of said spring means and adapted for reciprocal movement in an associated of said wells, said spring means urging the associated ball element into closed condition with respect to the respective seat of the port means, but being compressible by fluid pressure interiorly of the tank acting on the associated ball element so as to force the ball element into the well against the resistance to compression of the associated spring, said wells guiding the inward movement of the ball element away from its respective seat.



4,508,132

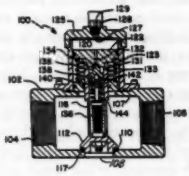
TEMPERATURE CONTROLLED VALVE MECHANISM AND METHOD

John M. Mayfield, Jr., Ukiah, and Vernon Haselswerdt, Willits, both of Calif., assignors to Microphor, Inc., Willits, Calif.

Division of Ser. No. 73,941, Sep. 10, 1979, Pat. No. 4,356,833. This application Jun. 28, 1982, Ser. No. 393,104

Int. Cl.[3] **G05D** *23/275;* **F16K** *31/122*

U.S. Cl. 137—62 **18 Claims**



1. A temperature controlled valve mechanism comprising: a valve housing, a plurality of valve inlets in said housing for connection with a circulating fluid system having a fluid continuously circulating therethrough, a flow through conduit in said housing extending between said valve inlets, a valve outlet in said housing for draining fluid from said flow through conduit, a valve closure member supported for movement toward and away from said valve outlet between closed and open positions, said valve closure member blocking and closing said valve outlet when in said closed position, means forming an expansion chamber in said housing, said expansion chamber including a movable wall, said valve closure member being coupled to said movable wall and being movable to increase the volume of said expansion chamber when in said closed position and decrease the volume of said expansion chamber when in said open position, biasing means for urging said valve closure member away from said closed position, means for supplying a pressurized medium other than the fluid of said fluid system to said expansion chamber to exert a force counteracting said biasing means to move said valve closure member to said closed position, and temperature activated venting means for venting and depressurizing said expansion chamber upon occurrence of a predetermined circulating fluid temperature, the venting of said expansion chamber causing said biasing means to rapidly move said valve closure member from said closed position.

4,508,133

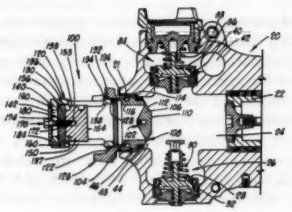
PROTECTIVE COVER RETAINER

Syed Hamid, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 31, 1984, Ser. No. 575,633

Int. Cl.[3] **F16K** *13/04;* **F04B** *39/12*

U.S. Cl. 137—68 R **9 Claims**



1. A retainer assembly adapted for use with a protective cover for a fluid end of a plunger-type pump adapted to relieve pressure in a cylinder of said pump when said pressure exceeds a predetermined limit, said cover being in fluid communication with said cylinder, said cover including an outer portion; an inner portion circumferentially surrounded by said outer portion; and a boundary comprising an area of reduced wall thickness between said inner and outer portions and adapted to fail above a predetermined pressure in said fluid end; said retainer assembly comprising:

means for securing said retainer to said fluid end; and

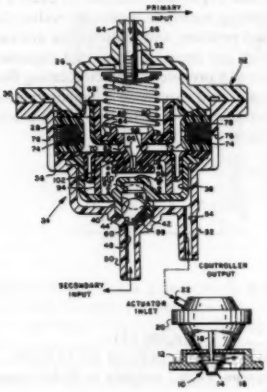
catcher means adapted to catch said shear disc upon failure of said boundary, said catcher means being cup-shaped and substantially coaxially aligned with said inner portion, the mouth of said cup facing said inner portion and said cup bottom having an aperture therethrough, said catcher further including impact receiving means disposed in said cup proximate said aperture, and shear plug means disposed between said impact receiving means and said inner portion.

4,508,134

CONTROLLING EGR IN AN INTERNAL COMBUSTION ENGINE AND FLUID PRESSURE SIGNAL CONTROLLER THEREFOR

William W. Kelly, Battle Creek, and Cyril E. Bradshaw, Kalamazoo, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 379,844, May 20, 1982,. This application Jun. 8, 1984, Ser. No. 618,709
Int. Cl.[3] F02M 25/06
U.S. Cl. 137—103 7 Claims



1. A fluid pressure signal controller comprising:

(a) housing means defining a fluid pressure chamber and having structure defining a primary inlet port thereto adapted for connection to a primary variable source of subatmospheric fluid pressure, said housing means including means defining a passage communicating said primary inlet port with said chamber;

(b) said housing means including structure defining a secondary fluid inlet port communicating with said chamber and adapted for connection to a secondary variable source of subatmospheric fluid pressure;

(c) said housing means including structure defining a signal outlet port communicating with said chamber;

(d) pressure responsive valve means disposed in said chamber and operative in response to the differences between the pressure in said passage and the pressure in said secondary port to move between a first position isolating said passage from said chamber and a second position isolating said secondary supply port from communicating with said chamber and permitting said passage to communicate with said chamber;

(e) said housing means including structure defining an atmospheric vent port communicating with said passage; and,

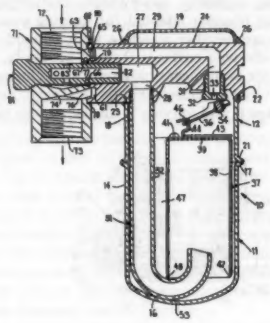
(f) pressure responsive bleed means operative to modulate venting of said passage to said vent port in response to changes in pressure in said primary port and said passage, wherein said bleed means modulates said primary input port vacuum to provide a control signal in said chamber for said output port and said valve means switches between said first and second positions in response to one of the primary or secondary supply ports having the higher absolute pressure, for controlling the signal to said outlet port.

4,508,135

COMBINED INLET AND OUTLET FITTING

Ronald D. Schlesch, Three Rivers, and Robert F. Lyons, Nottawa Township, Saint Joseph County, both of Mich., assignors to Armstrong International, Inc., Kalamazoo, Mich.

Continuation-in-part of Ser. No. 217,491, Dec. 17, 1980, abandoned. This application Sep. 24, 1982, Ser. No. 423,495
Int. Cl.[3] F16T 1/30
U.S. Cl. 137—185 26 Claims

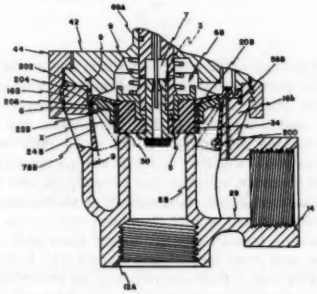


1. A combined inlet and outlet fitting for a fluid handling mechanism, comprising:

an elongated block having an inlet passage and an outlet passage extending lengthwise through said block, said inlet passage and said outlet passage having corresponding one ends adapted to be connected to the fluid handling mechanism in order to supply fluid to and to remove fluid from the mechanism, respectively, the opposite ends of said inlet passage and said outlet passage extending through the same one longitudinal end of said block; a coupling having one side attached to said one end of said block, said coupling having an inlet port adapted to be connected to a fluid supply conduit and a substantially oppositely directed outlet port adapted to be connected to a fluid discharge conduit, said coupling being interengaged at its said one side with said one end of said block so that said coupling can be moved arcuately about an axis extending lengthwise of said block so that said inlet and outlet ports can be located at selectable angular positions relative to said elongated block while remaining in fluid flow communication with said inlet and outlet passages, respectively; and fastening means for releasably securing said coupling in fluid-tight sealed relationship with said block, wherein the improvement comprises a fixed imperforate wall extending transversely across the coupling to commonly close the inner ends of said ports, said one end of said block being of circular cross section with a peripheral wall coaxial with said axis, said block being generally cylindrical from end to end to facilitate its lengthwise insertion into said mechanism, said coupling having a circular but shallow recess means in its said one side of diameter larger than said ports and into which slightly projects said one end of said block, lateral through openings of diameter less than said ports extending closely along the opposite side of said transverse wall from the inner ends of the respective inlet and outlet ports through said one side of said coupling, one said passage and said lateral through opening at the inner end of one said port together forming a straight through continuous elongate hole containing said axis of arcuate movement therein, said one end of said block having an annular groove therein loosely surrounding said hole and communicating with the other said passage in said block and with said lateral through opening at the inner end of the other said port, said recess means in said coupling and the circular cross section end of said block projecting thereinto having

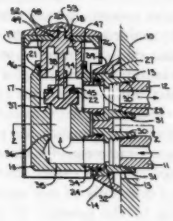
opposed fluid sealing faces, said fastening means extending in a direction away from said block through said coupling and having a portion accessible from the end of said coupling remote from the block for releasing said coupling from said block.

4,508,136
ANTI-SYPHON FLOW CONTROL VALVE
Carl L. C. Kah, Jr., 778 Lakeside Dr., North Palm Beach, Fla. 33408
Filed Sep. 29, 1982, Ser. No. 426,375
Int. Cl.³ F16K *24/02, 31/385*
U.S. Cl. 137—218 **1 Claim**



1. A flow control valve having a housing including an inlet and an outlet, a liquid valve means between the inlet and the outlet, said liquid valve means comprising a valve seat and a valve plug means for engaging said valve seat, a pressure responsive diaphragm mounted in said housing above said plug means, said plug means being connected to said pressure responsive diaphragm for movement therewith, said plug means being moved between an open and closed position by forces acting on opposite sides of said pressure responsive diaphragm, a first chamber being formed above said pressure responsive diaphragm with said housing, a second chamber being formed below said pressure responsive diaphragm with said housing, a diaphragm support ring being positioned in said second chamber to support said diaphragm when said liquid valve means has its valve plug means in its closed position, said valve seat opening into said second chamber, a first conduit means connecting said valve seat to said inlet, a second conduit means connecting said second chamber to said outlet, opening means connecting the exterior of said housing to said second chamber, anti-syphon valve means cooperating with said opening means to connect the exterior of said housing to said second chamber and valve seat when a suction occurs in said inlet, said anti-syphon valve means having valve flap means extending downwardly into said second chamber, said flap means cooperating with said opening means in said housing to normally close said opening means, said flap means being pulled inwardly into said second chamber when a suction occurs, said flap means contacting the first conduit means in their innermost position to block a reverse flow from the outlet to the inlet, said diaphragm support ring being position on projections extending inwardly from said housing, each projection extending between a pair of adjacent flaps, said flaps having notches to receive said projections, said flap notches engaging the sides of said cooperating projections when said flaps have been pulled inwardly.

4,508,137
WALL MOUNTABLE VACUUM BREAKER
Edwin F. Bolgert, Kohler, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Feb. 28, 1983, Ser. No. 470,272
Int. Cl.³ F16K *24/04*
U.S. Cl. 137—218 **4 Claims**



1. In a vacuum breaker connectable to a fluid supply pipe and a fluid outlet pipe, ends of both of the pipes being in substantial alignment with respect to each other and being positioned adjacent to an opening in a substantially vertical wall, the combination comprising:

an escutcheon mountable against the wall, the escutcheon having an inlet hole which is alignable with the fluid supply pipe, and an outlet hole which is alignable with the fluid outlet pipe;

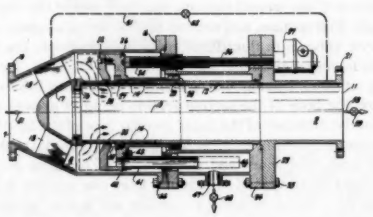
two coupling members, one of the coupling members being alignable with the inlet hole in the escutcheon so as to be connectable to the fluid supply pipe, and the other coupling member being alignable with the outlet hole in the escutcheon so as to be connectable with the fluid outlet pipe;

at least one of the coupling members abutting against the outer surface of the escutcheon so as to be able to hold the escutcheon against the wall, and both of the coupling members having a through bore to allow the flow of fluid through the coupling members;

a vacuum breaker valve body having an inlet port coupled to one coupling member and an outlet port coupled to the other coupling member, the vacuum breaker valve body also having a channel that connects the inlet port to the outlet port and a vacuum breaker valve in that channel; and

means for retaining the vacuum breaker valve body in a coupled relation with the coupling members.

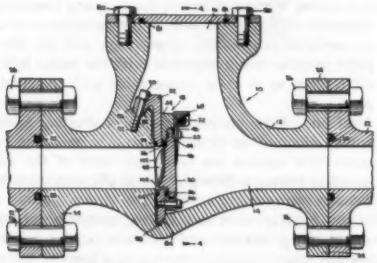
4,508,138
POLYJET VALVE WITH BACKWASH
Robert W. Dixon, Concord, Calif., assignor to Chas. M. Bailey Co., Inc., Emeryville, Calif.
Filed Aug. 5, 1983, Ser. No. 520,639
Int. Cl.³ F16K *3/26, 11/07*
U.S. Cl. 137—239 **8 Claims**



1. A valve comprising a body including means defining an inlet chamber disposed about an axis; means defining an outlet

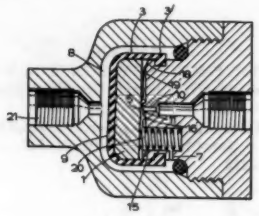
chamber disposed about said axis and adapted to communicate with said inlet chamber; a cylindrical polyjet sleeve disposed between said chambers and extending along said axis and having a plurality of radially extending, circumferentially arranged, axially spaced discrete openings therethrough and adapted to communicate with said inlet chamber and said outlet chamber, each of said openings having a predetermined axial length; a ring coaxial with and engaging said sleeve and defining an annular groove open to said sleeve and of substantially said predetermined axial length; means for moving said polyjet sleeve and said ring relative to each other along said axis for moving individual ones only of said openings progressively into registry with said annular groove regardless of the position of said ring; means for substantially blocking outflow from said outlet chamber; means for providing a drain from said annular groove; and means for circulating wash fluid from said inlet chamber into said outlet chamber and through successive individual ones only of said openings into said annular groove regardless of the position of said ring and into and through said drain.

4,508,139
TOP-ENTRY CHECK VALVE
Henry E. Teumer, 5308 Woodline Dr. S., Mobile, Ala. 36609
Filed Apr. 30, 1984, Ser. No. 605,051
Int. Cl.³ F16K *43/00*
U.S. Cl. 137—315 **10 Claims**



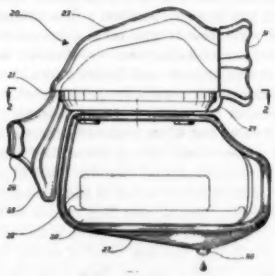
1. A removable valve seat for a check valve that has a pivotably mounted valving member movable between open and closed positions, the check valve comprising a check valve body and a valve seat having a first section and a second section, which sections are separable from one another and from the check valve body but which sections are normally attached to one another and to the check valve body, the check valve body and each section having a bore for the flow of fluid therethrough; a portion of the first section normally being next to a portion of the check valve body, a portion of the second section normally being next to a portion of the first section, a portion of the valving member being rotatably connected to a portion of the second section, and the bores of the check valve body, first section, and second section being aligned when the check valve is in fluid-flow operative condition; the first section having a circumferential lip around the bore, the lip having an outer annular face generally parallel to the axis of the bore; the bore of the second section being of greater diameter than the diameter of the outer annular face of the lip of the first section and having an inner face generally parallel to the axis of the bore; said inner and outer faces of the first and second sections being spaced sufficiently from one another and one or both faces being bevelled to contain and wedge between them sealing means that contacts the valving member when the valving member is in a closed position to effect a fluid-tight seal between the valving member and the valve seat.

4,508,140
HYDRAULIC FLOW CONTROL VALVES
Anthony W. Harrison, Birmingham, England, assignor to Lucas Industries public limited company, Birmingham, England
Filed Mar. 12, 1984, Ser. No. 588,381
Claims priority, application United Kingdom, Mar. 12, 1983, 8306852
Int. Cl.³ F16K *31/365*
U.S. Cl. 137—501 **9 Claims**



1. A regulator valve comprising first and second opposing rigid walls, portions of said walls having a rocking engagement with each other, a sealing membrane sealingly connecting together said walls around their peripheries and permitting relative rocking movement of said walls, confronting inner faces of said walls together with said sealing membrane bounding a first chamber, an outer face of said first wall bounding a second chamber, a first restriction of predetermined size connecting said first and second chambers, said second wall being formed with a transfer passage spaced from said rocking engagement, said inner face of said second wall being provided with a valve seat portion surrounding the end of said transfer passage adjacent to said first wall, a valve member portion of said inner face of said first wall defining with said valve seat portion a second restriction of variable size, and resilient means acting between said walls in the direction to increase the size of said second restriction, whereby an increase in the pressure in said second chamber relative to the pressure in said transfer passage brings about a reduction in the size of said second restriction.

4,508,141
SHOWER VALVE
Mikhail E. Tsipov, 120 Ruth Ellen, Cleveland, Ohio 44143
Filed Mar. 10, 1983, Ser. No. 474,204
Int. Cl.³ F16K *19/00, 31/60*
U.S. Cl. 137—560 **7 Claims**



1. A valve for interrupting the flow of water between a source and a showerhead comprising: a valve body; means within the valve body for interrupting water flow through the valve body; and actuating means for imposing the interrupting means into the water flow thereby terminating water flow

through the valve body, the actuating means including a receptacle configured to receive a soap product and being moveable between a closed position and a position whereby soap can be retrieved from the receptacle, the actuator means being configured whereby with the receptacle in the closed position water flow through the valve body is unimpaired by the interrupting means and with the receptacle in the retrieval position water flow through the valve is interrupted by the interrupting means.

4,508,142

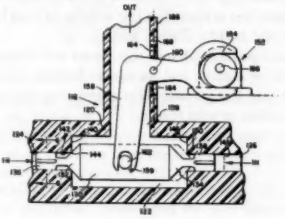
ZERO DISPLACEMENT LOW-SHEAR VALVE

William H. Eburn, Jr., Sudbury, Mass., and Stephen P. Kalenik, Merrimack, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 108,699, Dec. 31, 1979, abandoned. This application Oct. 28, 1981, Ser. No. 315,661

Int. Cl.³ F16K *41/12, 1/38, 11/06*

U.S. Cl. 137—625.4 **6 Claims**



1. A valve for controlling the flow of a fluid, comprising:

a housing for enclosing a particular volume of fluid, said housing having an inlet and an outlet for the passage of a fluid therebetween;

a movable member within said housing, movable between first and second positions for alternately blocking and unblocking fluid flow within said housing between said housing inlet and outlet, without changing the said fluid volume enclosed by said valve housing;

an elongated force coupling member projecting through an opening in a wall of said housing; and

a resilient, generally planar diaphragm that provides a fluid-tight seal between said elongated member and that portion of said housing wall through which said elongated member projects with a portion of said diaphragm being sealingly attached to said elongated member for movement therewith and with said elongated member being pivotally supported external of said resilient diaphragm and being pivotable about an axis within the plane of said generally planar diaphragm, about which neutral fluid-moving diaphragm movement of said particular volume of fluid occurs, when said elongated member is so pivoted.

4,508,143

DRAIN DISCHARGING APPARATUS

Yoshinari Ogasawara, Aichi, Japan, assignor to CKD Corporation, Aichi, Japan

Filed Sep. 30, 1982, Ser. No. 431,079

Claims priority, application Japan, Oct. 28, 1981, 56-172607

Int. Cl.³ F16K *31/05, 31/524*

U.S. Cl. 137—636.1 **2 Claims**

1. A drain discharging apparatus for automatically draining drainage from a compressed air source, said apparatus comprising:

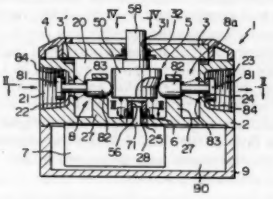
a body having therein a drain reservoir chamber, an inlet port adapted to be connected to a source of compressed air and drainage, an outlet port adapted to be connected with a drain, and first and second valve ports respectively connecting said inlet and outlet ports to said chamber for respectively introducing compressed air and drainage from said inlet port into said chamber and discharging compressed air and drainage from said chamber through said outlet port, said valve ports opening into said chamber at an inner periphery thereof;

first and second poppet valves positioned in said body, each said valve including a valve body urged by a respective spring into a first position closing communication through a respective said valve port;

a cam mounted in said body for rotation about an axis;

said cam having first surface means for urging said valve bodies against said respective springs to second positions opening communication through said respective valve ports;

motor means for continuously rotating said cam about said axis such that said first surface means alternately moves said valve bodies of said first and second poppet valves



from said first positions thereof to said second positions thereof without simultaneously moving both said valve bodies from said first positions thereof;

means for mounting said cam for movement with respect to said body along said axis;

spring means for urging said cam in a first axial direction to position said first surface means adjacent said valve bodies; and

said cam having second surface means for, upon movement of said cam in a second axial direction against said spring means, moving one of said valve bodies which is in said first position thereof to said second position thereof, while maintaining at all times during said movement said first surface against the other said valve body in said second position to thereby open both of said poppet valves to discharge said compressed air and said drainage.

4,508,144

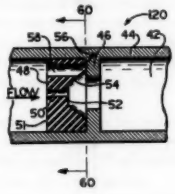
FLOW CONTROL DEVICE

Thomas B. Bernett, Arlington Heights, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 28, 1983, Ser. No. 555,853

Int. Cl.³ F15D *1/02*

U.S. Cl. 138—45 **11 Claims**



1. A flow control device for providing a substantially constant rate of fluid flow under varying pressure through a passageway in a housing, said device comprising a resilient member having spaced-apart upstream and downstream sides and dimensionally adapted to enable the member to be removably received within the housing with said downstream side having an intermediate region surrounded by a substantially flat pe-

ripheral surface facing in the downstream direction that is adapted to engage a seat in the passageway directly while assuring that the intermediate region remains in fluid communication with the downstream side of the passageway, said member having at least one flow control orifice extending therethrough between the upstream side and the downstream side within the intermediate region, said member having a plurality of bypass channels extending therethrough between the upstream side and downstream peripheral surface in the direction of fluid flow through the passageway in the housing, said plurality of bypass channels being in a spaced-apart array about the orifice, said orifice adapted to constrict and relax to maintain a substantially constant rate of fluid flow therethrough in response to compression and relaxation of the member against the seat in response to respective increases and decreases in the fluid pressure differential across the member, and said member having reduced tendency to flutter and improved resistance to fatigue failure arising from the repeated relaxation and compression thereof under varying fluid pressure differentials across the member as a result of said channels being positioned so that at least a portion of each intersects the intermediate region, the peripheral surface, and an intersection between the intermediate region and the peripheral surface to the extent necessary to enable compression and relaxation of the intermediate region adjacent the peripheral surface to control the flow of the fluid through the channels in response to respective increases and decreases in the fluid pressure differential across the member.

4,508,145

HEDDLE FRAME AND COMPOSITE FRAME SLAT CONSTRUCTION

James B. Bowen, and Charles F. Kramer, both of Greenville, S.C., assignors to Steel Heddle Mfg. Co., Greenville, S.C.

Filed Jul. 6, 1982, Ser. No. 395,736

Int. Cl.³ D03C *9/06*

U.S. Cl. 139—92 **13 Claims**

1. A heddle frame for a loom in which is carried a number of heddles which are supported on heddle rods across the frame through which warp yarn ends are threaded and raised and lowered to define a shed across the loom through which a weft yarn is inserted as said heddle frame is reciprocated by a heddle frame drive during weaving, said heddle frame comprising:

a pair of spaced frame sides;

a top frame slat carried between said frame sides;

a bottom frame slat spaced below said top frame slat in said frame;

said bottom frame slat consisting of an elongated hollow steel tubular member having connector means carried therein for making drive connection with a heddle frame drive;

a flange means carried by said bottom frame slat;

an integral heddle support rod carried by said flange means for supporting the lower ends of said heddles;

said top frame slat including a first portion formed from a steel tubular element and a second portion formed from an extrusion of lighter material so that the total weight of said top frame slat is less than the weight of said bottom frame slat in said heddle frame; and

said second portion of said top frame slat including an integral flange means, and an upper heddle support rod carried by said flange means for supporting the upper ends of said heddles in said frame.

4,508,146

GRIPPER PROJECTILE FOR A WEAVING MACHINE

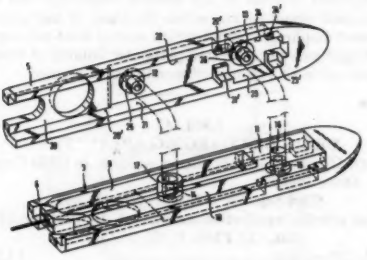
Otto Hintsch, Wallisellen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 16, 1983, Ser. No. 523,416

Claims priority, application Switzerland, Sep. 14, 1982, 5438/82

Int. Cl.³ D03J *5/06*

U.S. Cl. 139—196.2 **19 Claims**



1. A gripper projectile for a weaving machine comprising

a gripper for gripping weft yarn at one end;

a housing having said gripper mounted therein, said housing being divided in the plane of said gripper; and

a hollow stud of oval shape on one housing half and a groove in the other housing half receiving said oval-shaped stud in mating relation.

4,508,147

METHOD OF MANUFACTURING A POSITIVE ELECTRODE FOR A LEAD ACID ELECTRIC STORAGE CELL

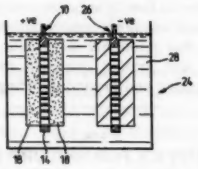
Patrick T. Moseley, Chilton, and Michael R. H. Hill, Wantage, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 22, 1983, Ser. No. 477,777

Claims priority, application United Kingdom, Mar. 22, 1982, 8208326

Int. Cl.³ H01M *4/38*

U.S. Cl. 141—1.1 **9 Claims**



1. A method of making a lead acid electric storage cell comprising the steps of

(i) chemically preparing particulate beta lead dioxide;

(ii) fabricating the beta lead dioxide into an electrode for a lead acid electric storage cell; and

(iii) assembling a lead acid electric storage cell comprising a positive electrode constituted by said beta lead dioxide electrode, a negative electrode constituted by a second electrode, and an electrolyte for the cell.

2. A method as claimed in claim 1, wherein step (ii) is carried out by mixing the beta lead dioxide with a relatively low proportion of a binder, and applying the mixture to a perforated electrically conductive support structure.

4,508,148

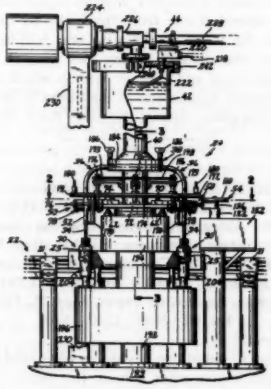
PHARMACEUTICAL FILLER APPARATUS

Hans W. Trechsel, Rockford; Allan B. Larson, Eden Prairie, and John A. Ryerse, Maple Grove, all of Minn., assignors to TL Systems Corporation, Minneapolis, Minn.

Filed May 6, 1983, Ser. No. 492,222

Int. Cl.³ B65B *43/50*

U.S. Cl. 141—147 **18 Claims**



1. A fluid dispensing and metering assembly comprising:

(a) a conveyor for conveying containers, first detection means for detecting movement of said conveyor past a first predetermined location;

(b) positioning means cooperating with said conveyor for positioning each of said containers proximate a fluid delivery conduit for receipt of fluid from said fluid delivery conduit;

(c) a reservor of fluid positioned above said containers at a predetermined height, said reservoir including means for maintaining a constant fluid level in said reservoir, said fluid delivery conduit being interconnected to said reservoir to provide a fluid flow path from said reservoir to said container positioned for receipt of fluid from said fluid delivery conduit; said fluid delivery conduit including a fixed orifice of substantially less diameter than the inside diameter of said fluid delivery conduit, said fixed orifice being positioned closer to the point of fluid discharge into the container than to said fluid reservoir;

(d) quick acting pinch valve means associated with said fluid delivery conduit for opening and closing said fluid delivery conduit, said pinch valve means having first and second positions, said valve means interacting with an elastic portion of said fluid delivery conduit, said elastic portion of said fluid delivery conduit being pinched shut by said valve means when said valve means is in said first position, said elastic portion of said fluid delivery conduit being fully opened when said valve means is in said second position, said valve means including biasing means for biasing said valve means towards the first position and further including releasable retention means for retaining said valve means in said second position, said valve means returning substantially simultaneously to said first position upon release by said retention means, said valve means including a first pivotal member having first and second ends, said first pivotal member being pivotal about a generally vertical axis positioned between said first and second ends, a spring means being interconnected to said first pivotal member for biasing said first pivotal member into a first position, an edge portion of said first pivotal member between said first end and said vertical pivot axis cooperating with a stationary member to pinch shut said elastic portion of said fluid delivery conduit when in said first position, said retention means including said first pivotal member cooperating with a second pivotal member to retain said first pivotal member in said second position, said second pivotal member being pivotal about a generally horizontal axis, said second pivotal member further being biased by biasing means in a vertical direction towards said first pivotal member;

(e) cam actuator means positioned downstream from said first detection means for positioning said valve means in said second position;

(f) first timing means for monitoring movement of said containers after being detected by said first detection means, said first timing means activating said cam actuator means when one of said containers and its associated valve means are suitably positioned adjacent said cam actuator means, said cam actuator means positioning said valve means in said second position upon being activated by said first timing means;

(g) second detection means for detecting the positioning of said valve means in said second position;

(h) second timing means for monitoring the amount of fluid delivered into said containers;

(i) release means activated by said second timing means for releasing said retention means; and

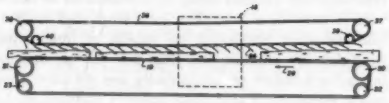
(j) said positioning means including a rotary apparatus rotating about a vertical axis offset from said conveyor, said rotary apparatus including a plurality of stations each adapted for receipt of one of said containers, each of said containers including one of said delivery conduits, one of said pinch valves, and one of said release means operatively interconnected to dispense and meter a predetermined amount of fluid into said associated container.

4,508,149

LOG CONVEYING APPARATUS

William R. Carroll, 2332 Bellevue Ave., West, Vancouver, B.C., Canada V7V 1T4

Filed Oct. 12, 1982, Ser. No. 433,742
Int. Cl.³ B27B *31/00*
U.S. Cl. 144—245 A **9 Claims**



6. Apparatus for conveying logs to processing equipment in a sawmill comprising:

an elongated framework intersected by the processing equipment,

a main conveyor extending through the elongated framework, said main conveyor having an endless chain including a substantially horizontal upper run for seating a longitudinally extending log,

a top hold-down conveyor having an endless chain provided with longitudinally spaced spring flight means flexed into gripping engagement with the surface of the log for engaging and locating a log seated on the upper run of the main conveyor, said endless chain of the top hold-down conveyor having a lower run spaced from and normally adapted to extend parallel to the upper run of the main conveyor,

an infeed frame supporting a first portion of the hold-down conveyor in advance of the processing equipment,

an outfeed frame supporting a second portion of the hold-down conveyor beyond the processing equipment,

hoisting means suspending the infeed and outfeed frames from the elongated framework and operable to separately raise and lower the first and second portion of the hold-down conveyor whereby to vary the spacing between the upper and lower runs and to incline the upper run at the first and second portions with respect to the lower run of the main conveyor; and

means for driving the main and hold-down conveyors to advance the upper and lower run in unison and move the log endwise into feeding engagement with the processing equipment.

4,508,150

RETRACTABLE TRACTION INTENSIFYING MEANS FOR AGRICULTURAL TRACTORS AND THE LIKE

Thorvald G. Granryd, Lake Forest, Ill., assignor to TG Strips, Inc., Lake Forest, Ill.

Filed Jan. 3, 1984, Ser. No. 567,625
Int. Cl.³ B60C *27/20, 27/10, 27/08*
U.S. Cl. 152—169 **13 Claims**

1. Traction intensifying means for a rubber tired vehicle having a power driven tire, including side walls, under-tread faces and tire lugs, each of the tire lugs having a lug height, a lug length, a leading lug side, a lug angle and a shoulder, said traction intensifying means comprising

a series of ground engaging spades for mounting on such a tire in a position to be movable between ground engaging and ground avoiding contact, each of said ground engaging spades having a lug portion, a sole portion, a base portion and a spade angle related to the lug angle of the tire,

a series of anchor means, each one of said series being secured to a shoulder of a tire lug of the tire,

at least two lengths of wire rope, each one of said lengths being mounted upon said series of anchor means for rotational movement relative thereto, and

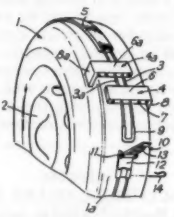
coupling means for fixedly securing said base portion of each of said ground engaging spades onto said lengths of wire rope, such that rotational movement of said wire ropes will move said ground engaging spades between said ground engaging and ground avoiding contact.

4,508,151

NON-SKID DEVICE FOR MOTOR-VEHICLE TIRES

Jean Sepheriades, 33, rue Bayen, 75017 Paris, and Joël Lecharpy, 40, rue de Mauregard, 78690 Levis-Saint-Nom, both of France

Filed Feb. 8, 1984, Ser. No. 578,012
Claims priority, application France, Feb. 16, 1983, 83 02527
Int. Cl.³ B60C *27/06*
U.S. Cl. 152—213 A **7 Claims**



1. A non-skid device for pneumatic tires of motor-vehicles, wherein said device comprises at least two strands of cable joined at their ends by fastening means and on which are adjustably threaded a plurality of pairs of half-brackets, forming clamps, separated one from the other by cross-pieces in contact with the tread of the tire, said half-brackets being symmetrically placed and having one branch which rests against the tire tread and another branch which rests, for one of the half-bracket, against one of the flanks of the tire, and for the other half-bracket, against the other flank of the tire.

4,508,152

PNEUMATIC RADIAL TIRES HAVING AN IMPROVED BEAD PORTION DURABILITY

Shigehisa Sano, Akigawa; Isao Seto, Kodaira; Hiroyuki Koseki, Ohmiya, and Mana Minomura, Mitaka, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jan. 18, 1984, Ser. No. 571,881
Claims priority, application Japan, May 24, 1983, 58-90060
Int. Cl.³ B60C *15/00, 9/02*
U.S. Cl. 152—356 R **5 Claims**

1. A pneumatic radial tire having an improved bead portion durability, which comprises a main tire body reinforcement comprising a carcass of at least one ply containing metal cords arranged in the radial direction of the tire, and a bead portion reinforcement comprising a layer of metal cords obliquely arranged along the turnup portion of said carcass which is wound around a bead core in each of the bead portions from the inside to the outside with respect to the cords of said turnup

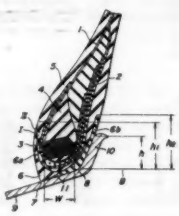
portion, characterized in that said bead portion reinforcement is composed of a support reinforcing layer and a turnup-end protecting layer independently arranged on the lateral inside and lateral outside of the bead core respectively, and said turnup-end protecting layer has a modulus of elasticity at 1% elongation in cord direction smaller than that of said support reinforcing layer and is disposed over an area extending from an intermediate level between the radial inner and radial outer diameters of said bead core to a level radially outward of the upper end of said turnup portion.

4,508,153

PNEUMATIC TIRES

Tsutomu Tanaka, Kodaira; Mitsuhisa Yahagi, Sayama, and Shuichi Watanabe, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 25, 1984, Ser. No. 613,998
Claims priority, application Japan, May 26, 1983, 58-91520
Int. Cl.³ B60C *15/06, 15/04*
U.S. Cl. 152—362 CS **4 Claims**



1. A pneumatic tire comprising a carcass composed of at least one cord ply extending between a pair of bead portions, an inner liner adhered to the inner surface of the carcass, and a rubber reinforcing layer made of a rubber composition different from and having a Shore A hardness higher than that of the inner liner and disposed at a lower part of the bead portion including a bead toe portion and a bead heel portion to form an outermost bead rubber at least at that region of the bead portion which comes into contact with a rim;

said rubber reinforcing layer being divided into an axially inside portion inclusive of the bead toe portion and an axially outside portion extending from a boundary surface located in an area between the bead toe portion and a position corresponding to ½ of a height of a rim flange,

said axially outside portion being extended over the height of the rim flange outwardly in the radial direction of the tire, and

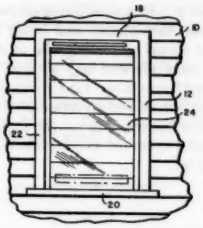
rubber of said axially inside portion being small in the Shore A hardness and abrasion resistance index and high in the breaking energy after heat deterioration as compared with that of said axially outside portion.

4,508,154

WINDOW CASEMENT

Everett T. Wheeler, 293 Mt. Vernon St., Lawrence, Mass. 01843

Filed Dec. 2, 1983, Ser. No. 557,328
The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.
Int. Cl.³ E06B *3/32*
U.S. Cl. 160—98 **16 Claims**



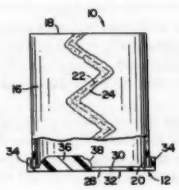
1. A window casement, structured to be set into a wall opening and to be permanently attached to the studding peripherally of the opening comprising a frame defined by rectangularly arranged space parallel top, bottom and side members, spaced parallel front and back panels mounted in said frame defining with the top, bottom and side members a closed chamber, said front and back panels being light transmitting and said back panel containing at the top and bottom narrow transversely arranged openings providing communication with the interior of the building within which the casing is installed and means within the chamber for one the one hand absorbing heat from light entering the front panel, and transmitting it throught said narrow openings into the building and on the other hand to reflect heat entering the front panel.

4,508,155

APPARATUS FOR AND METHOD OF OBTAINING IMPROVED DENTAL CASTINGS

Carl H. Rousseau, 2648 South Dr., Clearwater, Fla. 33519

Filed Jun. 4, 1982, Ser. No. 385,025
Int. Cl.³ B22C *7/02, 9/04, 21/00*
U.S. Cl. 164—35 **10 Claims**



1. An apparatus for the preparation of a dental casting from a dental pattern utilizing a curable investment material which undergoes an exothermic reaction and expansion upon curing; comprising:

a resilient expandable investment ring means being comprised of a substantially columnar tube which is open at both ends and having a fracture extending along the entire longitudinal dimension thereof;

said resilient expandable investment ring means being biased by said resiliency thereof to substantially close said fracture;

a base means defined by a plate having a top and a bottom surface with a substantially circular lip extending from said top surface;

said circular lip having an inside diameter which is greater than the outside diameter of said investment ring means;

a sprue former disposed on said base means;

a runner bar means having a proximal end portion and a distal end portion with said proximal end portion forming an angle with respect to said distal end portion;

said proximal end portion being operatively disposed on said sprue former and with said distal end portion receiving the dental pattern; and

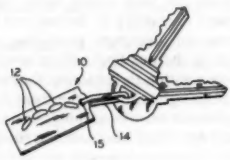
said investment ring means being disposed on said top surface of said base means and being disposed about said runner bar means by placing one of the open ends of said columnar tube on said top surface of said base means enabling said columnar tube to expand at said fracture against said bias of said investment ring means to open said fracture to accommodate for the expansion of the investment material upon the exothermic reaction of the investment material.

4,508,156

PERSONALIZED ITEMS AND PROCESS FOR MAKING THEM

Julia G. Banks, and William Ficho, both of Chicago, Ill., assignors to Vasilia Ltd., Chicago, Ill.

Filed Sep. 28, 1982, Ser. No. 425,384
Int. Cl.³ B22C *9/02*; A44C *25/00*
U.S. Cl. 164—35 **5 Claims**



1. A process using a mailer kit for making a do-it-yourself impression of human teeth in order to create an item in the form of a metal charm with personalization, said process comprising the steps of:

a. forming an impression blank comprising a layer of wax which takes an impression of teeth responsive to a bite on said blank at room temperatures, said wax layer being formed as an overlay on a layer of cardboard, said layer of wax having a uniform thickness across the surface of said cardboard substantially equal to the tip ends of the biting edges of human teeth, whereby said cardboard precludes anymore than said tip ends from making an impression in said wax;

b. biting into the top of said wax layer as far as said cardboard in order to create impressions of the tip biting edges of teeth while using the cardboard to establish and to limit the depth of a bite and to preclude embossing the bottom of said wax layer with opposing teeth; and

c. casting the impression of the wax layer into a metal charm.

5. A metal charm made by the process as defined in claim 1.

4,508,157

SELF-TAPPING SUPPORT FOR SHELL MOLDS

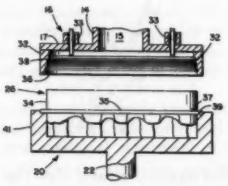
Dennis A. Belliveau, Manchester, and Eugene W. Thomas, Amherst, both of N.H., assignors to Hitchiner Manufacturing Co., Inc., Milford, N.H.

Filed Apr. 15, 1983, Ser. No. 485,196
Int. Cl.³ B22D *27/16*
U.S. Cl. 164—63 **7 Claims**

1. In a method of casting metal in a low temperature bonded sand grain, gas permeable, mold, by applying a reduced pressure to an external upper mold surface to draw molten metal into cavity means in the mold, that improvement comprising,

providing a mold having a peripheral, generally cylindrical, exterior side surface portion

providing a vacuum chamber having a downwardly facing opening defined by a downwardly extending wall with an internally threaded generally cylindrical engagement surface portion sized and shaped to snugly engage said exterior side surface portion of said mold,



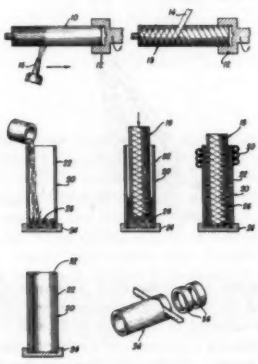
engaging said mold with said chamber internally threaded engagement surface portion by moving said upper mold surface into said chamber opening while simultaneously causing relative rotation of said mold and said chamber engagement surface portion, whereby said threads engage said side mold surface portion.

4,508,158

GRAPHITE-METAL MATRIX BEARINGS AND METHODS OF MANUFACTURING

Maurice F. Amateau, Hinsdale, and Keith R. Karasek, Villa Park, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 22, 1983, Ser. No. 468,532
Int. Cl.³ B22D *19/02*
U.S. Cl. 164—110 **8 Claims**



1. A method of manufacturing a graphite fiber metal matrix material comprising:

winding graphite fiber around an outer surface of a removable metal mandrel having a cylindrical outer surface to form a graphite fiber-wrapped mandrel;

sealing a first open end of a tubular mold with a cap member;

pouring molten metal into the interior of said tubular mold;

plunging said graphite fiber-wrapped mandrel into said tubular mold to force said molten metal toward a second open tubular mold end within a space defined between an outer surface of the fiber wrapped mandrel and an inner surface of said tubular mold;

solidifying an upper portion of said molten metal to form a molten metal seal between said outer mandrel surface and said inner tube surface and then forcing said fiber-wrapped mandrel further into said tubular mold to in-

crease the hydrostatic pressure on a remaining liquid portion of the molten metal and force the molten metal between said graphite fiber and said mandrel;

solidifying the remainder of said molten metal while said molten metal is in intimate contact with said graphite-fibers to adhere said bearing metal to said inner mold surface and to embed said graphite fiber within said bearing metal;

removing said mandrel from said mold to provide a graphite fiber metal matrix material including a tubular mold having a compliant metal tenaciously adhered to its inner surface, and having graphite fiber embedded within said compliant metal.

4,508,159

MOLD WITH FEEDER CHANNEL FOR THE CASTING OF METALS, IN PARTICULAR, FOR LOW-PRESSURE CASTING

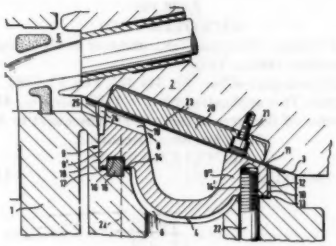
Reinhard Woltmann, Gröbenzell, and Karl Sixt, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,299

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117408

Int. Cl.³ B22D *17/06*

U.S. Cl. 164—306 **20 Claims**



1. Mold defining a mold cavity for the casting of metals, in particular, for low-pressure casting, comprising at least two mold parts which are joinable with one another along a parting plane, and a trough-shaped feeder channel which extends through one of the mold parts while defining an intermediate space therebetween, said feeder channel communicating with the mold cavity by at least one inlet channel, wherein the trough-shaped feeder channel is clamped between the two mold parts at an attachment flange means thereof, a top edge of said flange means being approximately parallel to said parting plane, a side edge of said flange arranged for positively engaging one of the two mold parts in at least the area of said inlet channel to form a seal and, at least the opposite side edge of said flange in another area, being connected in a manner for permitting thermal expansion of the trough-shaped feed channel with respect to said mold parts in a direction parallel to said parting plane.

4,508,160

PROCESS FOR COOLING IN INGOT DURING CONTINUOUS CASTING

Raoul Sautebin, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 25, 1982, Ser. No. 436,593

Claims priority, application Switzerland, Nov. 20, 1981, 7448/81

Int. Cl.³ B22D *11/124*

U.S. Cl. 164—467 **14 Claims**

1. A process which comprises: casting an ingot in a mold; providing a coolant having added thereto a substance which is soluble in the coolant and which releases gas as a decomposition product on striking a hot ingot surface; and applying said coolant-substance mixture to the surface of the ingot as it emerges from the mold, thereby decomposing said substance, releasing a gas as a decomposition product, to form an insulating film on the ingot surface and reducing the rate of heat extraction.

4,508,161

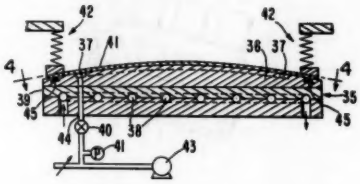
METHOD FOR GAS-ASSISTED, SOLID-TO-SOLID THERMAL TRANSFER WITH A SEMICONDUCTOR WAFER

Scott C. Holden, Manchester, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 381,669, May 25, 1982, Pat. No. 4,457,359. This application Mar. 2, 1984, Ser. No. 585,819

Int. Cl.³ F28F *13/00*

U.S. Cl. 165—1 **9 Claims**



1. A method for thermal transfer with a thin flexible workpiece in vacuum, comprising the steps of:

providing a platen having a nonplanar surface for receiving said workpiece and forming a solid-to-solid contact with the back side of said workpiece;

clamping said workpiece at its periphery against said planten surface to produce a platen-to-workpiece preloading contact pressure; and

introducing a gas into microscopic voids between said workpiece and said platen surface at a predetermined pressure above the level sufficient to cause bowing and reduced thermal transfer with a workpiece which is not preloaded, said predetermined gas pressure being less than said preloading contact pressure.

4,508,162

DOUBLE FLOOR

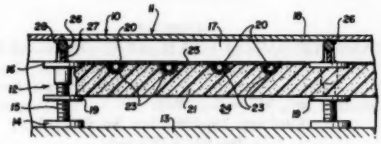
Manfred Radtke, Margetschochheim, Fed. Rep. of Germany, assignor to Mero-Werke Dr.-Ing. Max Mengeringhausen GmbH & Co., Fed. Rep. of Germany

Filed Sep. 15, 1982, Ser. No. 418,193

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137410

Int. Cl.³ F24H *9/08*

U.S. Cl. 165—56 **12 Claims**



1. In a double floor with framed floor plates of a heat conductive or heat storage material, the improvement comprising a system of pipes for carrying a heating or cooling medium, holding and fixation elements supporting said pipes, and up-

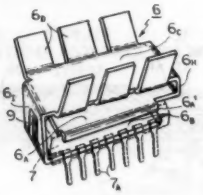
right bearings supporting the floor plates and also supporting said holding and fixation elements to maintain said system of pipes in heat-conductive contact with the bottom surfaces of the floor plates, said upright bearings having support plates movably mounted thereon for vertical adjustment, and said holding and fixation elements being mounted on said support plates, whereby the height of said holding and fixation elements can be adjusted to vary the force of contact of said pipes with the bottom surfaces of the floor plates.

4,508,163

HEAT SINKS FOR INTEGRATED CIRCUIT MODULES

Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.

Filed Jan. 18, 1983, Ser. No. 458,833
Int. Cl.³ H01L *23/02, 23/48*
U.S. Cl. 165—80 B **2 Claims**



1. One-piece heat-sink apparatus for an electronics package the body of which has the general form of a thin elongated rectangular parallelepiped, comprising first, second and third elongated elements integrally connected in series by first and second connection means, all of said elements and connection means being formed of thin sheet metal, said first and second elements being held in substantially parallel spaced alignment with another and with said third element adjacent one side thereof by said connection means, said first connection means holding said first element in a cantilevered relation to one end of said third element at substantially a first distance therefrom, said second connection means holding said second element in a cantilevered relation to said third element at substantially a second distance therefrom which is less than said first distance, said third element being exposed to the ambient environment and being shaped for release thereto of heat conducted to it from the package independently from said first and second elements, said first element being substantially flat and proportioned to about closely and substantially coextensively with one surface of the package, and elongated stiffening means stamped as part of said first connection means and imparting to the cantilevered combination of said first element and said first connection means a stiffening which tends to approach that of the cantilevered combination of said second element and said second connection means, whereby, upon insertion of such a package between said first and second elements they tend to flex cooperatively and allow said first element to clasp itself in close abutting relationship with the nearby surface of the package.

4,508,164

DASH POT BASKET FOR HEAT EXCHANGER TUBE CLEANING ELEMENT

Walter J. Baron, Milwaukee, Wis., assignor to Water Services of America, Inc., Milwaukee, Wis.

Filed Sep. 16, 1983, Ser. No. 533,144
Int. Cl.³ F28G *1/12*
U.S. Cl. 165—95 **4 Claims**

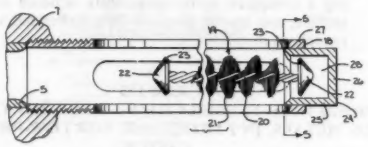
1. For use in a heat exchanger having a housing containing a plurality of fluid flow tubes arranged with exposed open ends, the combination comprising:

(a) an elongated basket adapted to capture a tube cleaning element which includes an elongated brush terminating in cap means and which is propelled through the tube by fluid,

(b) the outer end portion of said basket having stop means thereon for engagement by a said cleaning element,

(c) and means on said basket for decelerating said cleaning element before the latter reaches said stop means,

(d) said cleaning element decelerating means comprising dash pot means disposed at the outer end of said basket for forming a hydraulic cushion for said cleaning element,



(e) said dash pot means forming a recess for receiving said cleaning element and with said recess including said stop means,

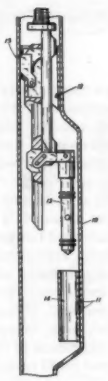
(f) said dash pot means and said cap means forming a restricted circumferential passage through which fluid escapes from said recess into said basket as said cap means approaches said stop means.

4,508,165

KICKOVER TOOL

Tommy C. Foust, Watauga, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 349,441, Feb. 17, 1982, Pat. No. 4,442,893. This application Nov. 8, 1982, Ser. No. 439,859
The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.
Int. Cl.³ E21B *23/02*
U.S. Cl. 166—117.5 **14 Claims**



1. A kickover tool comprising,

an elongate body having a first side and connector at its upper end,

an elongate actuator having a second side and locator key at its upper end,

means slidably interconnecting the first and second sides of said body and actuator in confronting relationship,

an arm pivoted to one of said body and actuator adjacent its lower end,

said arm having a support section,

a tool carrier pivoted to the free end of said support section of said arm,

means between said arm and the other of said body and actuator moving said arm between a position substantially

coaxial with said body and a position transverse thereof, and

means releasably holding said body and actuator together in a first position with said support section extending substantially aligned with said body and in a second position with said support section extending transverse of said body.

4,508,166

SUBSURFACE SAFETY SYSTEM

Billy G. Becker, and Charles V. Swafford, both of Ventura, Calif., assignors to BST Lift Systems, Inc., Ventura, Calif.

Filed Apr. 6, 1983, Ser. No. 482,584

Int. Cl.³ E21B *23/03*

U.S. Cl. 166—117.5 **7 Claims**

1. A subsurface safety system, which comprises:

an elongated entry mandrel having at one end thereof an outlet including means for interconnecting with a production tubing string to the surface and at the other end thereof primary inlet and a secondary inlet laterally spaced apart from said primary inlet;

a full bore primary tubing connected at one end to and extending from said primary inlet, the other end of said primary tubing including means for interconnecting with a production tubing string to a formation;

a full bore secondary tubing connected at one end to and extending from said secondary inlet generally parallel to said primary tubing, the other end of said secondary tubing string being open;

a packer surrounding said primary tubing string and said secondary tubing between the respective ends thereof;

wireline removable means for plugging said secondary inlet to prevent communication between said entry mandrel and said secondary string;

means positioned between said packer and said entry mandrel for venting said secondary string;

a primary tubing retrievable subsurface safety valve positioned in said primary tubing;

a secondary tubing retrievable subsurface safety valve positioned in said secondary tubing valve between said means for venting said secondary tubing and said open end;

means for deflecting well tools toward said primary inlet including a diverter shoe formed in said entry mandrel having a surface sloping toward said primary inlet;

means for temporarily plugging said primary inlet including a whipstock plug insertable in said primary inlet, said whipstock plug having a sloping upper surface positionable to deflect well tools toward said secondary inlet;

and means for aligning well tools with respect to said primary and secondary inlets including a guide shoe positioned in said entry mandrel below said outlet, said guide shoe including an annular shoulder facing said outlet, said shoulder having complimentary flanks sloping away from said outlet toward a keyway.

4,508,167

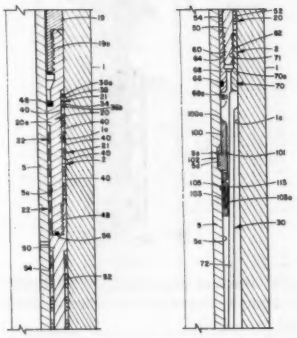
SELECTIVE CASING BORE RECEPTACLE

Roger A. Weinberg, Houston, and Mark C. Glaser, Bellaire, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Aug. 1, 1983, Ser. No. 519,392

Int. Cl.³ E21B *23/02*

U.S. Cl. 166—120 **29 Claims**



1. A packoff assembly for cooperation with a selected one of a plurality of polished bore receptacles incorporated in spaced relationship in a well casing string, each receptacle having a polished bore and upwardly and downwardly facing shoulders respectively above and below the polished bore; a tubular mandrel connectable to a tubular conduit extending to the well surface; a tubular body assemblage surrounding said mandrel and releasably connected thereto; seal means on said tubular body assemblage for establishing sealing integrity between the exterior of said mandrel and the polished bore of a selected receptacle; a first normally contracted, radially expansible abutment element mounted on the upper portion of said tubular body assemblage; means on said tubular body assemblage for radially expanding said first abutment element to engage the upwardly facing shoulder on the selected polished bore receptacle; a second normally contracted radially expansible abutment element on the lower portion of said tubular body assemblage; and means responsive to axial movement of said mandrel for radially expanding said second abutment element to engage the downwardly facing surface on the selected polished bore receptacle; thereby anchoring said tubular body assemblage to the selected polished bore receptacle independently of said mandrel and permitting axial movements of said mandrel relative to the polished bore receptacle while sealing the annulus between said mandrel and the polished bore receptacle.

4,508,168

RF APPLICATOR FOR IN SITU HEATING

Vernon L. Heeren, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 164,723, Jun. 30, 1980, abandoned. This application Nov. 20, 1981, Ser. No. 323,212

Int. Cl.³ E21B *43/25*

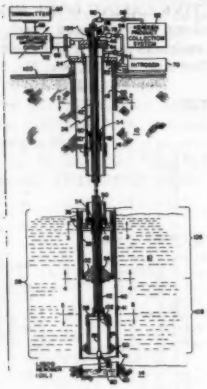
U.S. Cl. 166—248 **19 Claims**

1. The method of producing organic products from a body of oil shale beneath an overburden comprising:

generating electrical energy in the frequency range between 100 kilohertz and 100 megahertz;

transmitting said energy via a first transmission line having a

first characteristic impedance through a first impedance transformation structure to a second transmission line which has a second characteristic impedance and which extends through said overburden and which is coupled to a radiating structure through a second impedance trans-



formation structure positioned in said body of oil shale and substantially impedance matched to said transmission line; and

varying the impedance matching of said first impedance transformation structure to compensate for changes in temperature of said oil shale body.

4,508,169

METHOD FOR DETERMINING CONNATE WATER SATURATION AND SALINITY IN RESERVOIRS

Alan D. Mut, and Harry A. Deans, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Dec. 10, 1982, Ser. No. 448,867

Int. Cl.³ E21B *49/08*

U.S. Cl. 166—250 **11 Claims**

1. A method for determining the connate water saturation and salinity of an oil-bearing reservoir penetrated by a wellbore comprising:

(a) injecting a known volume of fluid into said reservoir through said wellbore wherein said fluid is miscible with said oil and has the ability to dissolve a limited amount of said water and wherein the solubility of said water in said fluid depends on the salinity of said water;

(b) producing said wellbore while taking samples of the produced fluids until oil breakthrough occurs;

(c) analyzing the water content of said samples;

(d) plotting the data from said analyzation as a function of the volume of produced fluids, said plot showing a hump-type deviation from a plateau-type water peak; and

(e) comparing said plot to mathematically-simulated type curves having known saturation and salinity values.

4,508,170

METHOD OF INCREASING THE YIELD OF HYDROCARBONS FROM A SUBTERRANEAN FORMATION

Wolfgang Littmann, Bleichenstrasse 32, D-3050 Wunstorf 2 (Steinhude), Fed. Rep. of Germany

Filed Jan. 27, 1983, Ser. No. 461,668

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202492

Int. Cl.³ E21B *43/24*

U.S. Cl. 166—272 **7 Claims**

1. A process for increasing the yield of hydrocarbons from a subterranean formation consisting essentially of:

(a) passing either hot water without additives or steam into the formation, thereby heating said formation to a temperature of 100° to 250° C., and

(b) subsequently flooding the formation with a cold aqueous solution containing a polymer additive which increases its viscosity.

4,508,171

OIL RECOVERY METHOD

James E. Shaw, c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Filed Apr. 13, 1984, Ser. No. 599,862

Int. Cl.³ E21B *43/22*

U.S. Cl. 166—273 **14 Claims**

1. A process for the recovery of oil from an oil bearing subterranean formation penetrated by at least one injection well and at least one production well which comprises:

(a) injecting a slug of an aqueous alkaline solution containing a water-soluble sulfite and a water-soluble aldehyde through an injection well under conditions to cause sulfoalkylation of oil in the formation and produce a surfactant in situ;

(b) causing the so-injected slug to move from the injection well towards one or more production wells displacing oil present in said formation, and

(c) recovering displaced oil from at least one of said production wells.

4,508,172

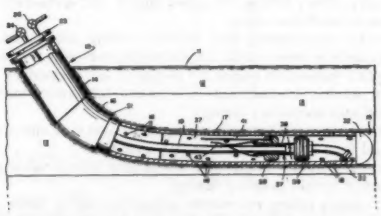
TAR SAND PRODUCTION USING THERMAL STIMULATION

Donald S. Mims, and Richard S. Allen, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 9, 1983, Ser. No. 492,865

Int. Cl.³ E21B *43/24*

U.S. Cl. 166—303 **4 Claims**



1. Well completion for producing bitumen emulsion from a subterranean tar sand layer in which the bitumen is releasably held, which completion includes:

an elongated, perforated liner which is disposed in a wellbore, the latter being in substantial horizontal alignment with respect to the tar sand layer having an upper end, and terminating at a remote injection end,

a conductor extending longitudinally of said liner having at least one discharge port adjacent to the liner remote end, and communicated at the other end to a pressurized

source of a hot stimulating fluid whereby said fluid can be conducted through said conductor and injected into the substrate adjacent to said liner,

a well head at the upper end of the respective liner and the conductor,

flow diverter means within said liner operably registered in the conductor to be moved longitudinally therealong, said flow diverter means being actuable to engage the liner walls and form an annular seal thereby to segregate the liner into discrete injection and producing segments respectively,

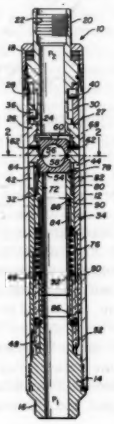
means for displacing said flow diverter through said liner whereby to concurrently adjust the length of the respective injection and producing segments,

and a conductor positioning bracket engaging said conductor and liner respectively, to fixedly position the conductor at the liner remote injection end.

4,508,173
FLOW CONTROL VALVE FOR USE ON OIL AND GAS WELLS OR THE LIKE

Norman W. Read, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 26, 1983, Ser. No. 536,465
Int. Cl.³ E21B *34/12*
U.S. Cl. 166—330 **9 Claims**



1. A flow control valve for use in oil and gas wells and the like, said valve comprising:

a tubular housing member having first and second ends;

rotatable means connected for rotation to said first end and adapted to be connected to a tubing string positioned in said well;

a valve member having a flow passageway extending therethrough pivotally supported in said tubular housing member for movement between open and closed positions;

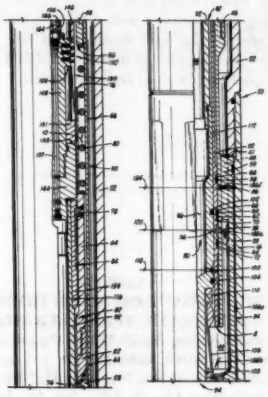
first and second valve actuators each having one end operably connected to said rotatable means and located in said housing member, and being movable therein linearly and in opposite directions simultaneously upon rotation of said rotatable means; and,

groove and pin means for connecting between the other ends of said valve actuators and said valve member on opposite sides thereof and forming a force couple to pivot said valve member between said positions when rotating said rotatable means regardless of the linear directions of travel of said actuators.

4,508,174
DOWNHOLE TOOL AND METHOD OF USING THE SAME

Neal G. Skinner, and David S. Wesson, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 31, 1983, Ser. No. 480,981
Int. Cl.³ E21B *34/14, 49/00*
U.S. Cl. 166—373 **15 Claims**



1. A tool for sensing, with a sensor device, a condition in a well having a fluid, said tool comprising:

a slidable valve member having a first port defined therein;

an inwardly directed member associated with said valve member;

biasing means for exerting a biasing force on said valve member;

support means having a top end and a bottom end, for supporting said valve member and said biasing means, said support means including a second port for receiving said fluid from said well;

housing means having a cavity defined therein for receiving said sensor device and further having a third port defined therein in communication with said cavity; and

connector means, disposed on said housing, for engaging and moving said valve member relative to said second port when said housing is disposed within said support means, said first and third ports are in fluid communication, and an opposing force greater than said biasing force is applied to said housing in opposition to said biasing force, said connector means including a collar rotatably mounted on said housing means, said collar having defined therein:

first channel means for receiving and engaging said inwardly directed member when said housing means is moved a first distance into said support means toward said bottom end;

second channel means for receiving and engaging said inwardly directed member when said housing means is moved a second distance away from said bottom end, after having been moved said first distance;

third channel means for receiving and engaging said inwardly directed member when said housing means is moved a third distance, toward said bottom end, after having been moved said first and second distances; and

fourth channel means for receiving and disengaging said inwardly directed member when said housing means is moved a fourth distance, away from said bottom end, after having been moved said first, second, and third distances.

8. A method of operating a wireline-connected housing having a first port which is to be brought into fluid communication with a second port of a sliding sleeve valve and a third port of a valve body, which slidi[illegible]leeve valve and said valve body are disposed in a pipe strin[illegible] in a well, and which sliding

sleeve valve is biased by a biasing force to maintain said second and third ports in fluid-tight separation, said housing having a connector means associated therewith for locking with said sliding sleeve valve, said method comprising the steps of:

lowering said housing with said wireline into said well until said first port is below said second port;

lifting said housing with said wireline until said first port is substantially aligned with said second port and said connector means locks with said sliding sleeve valve; and

tensioning said wireline with a force greater than said biasing force so that said housing and said engaged sliding sleeve valve are moved upward until said first, second and third ports are in fluid communication.

4,508,175

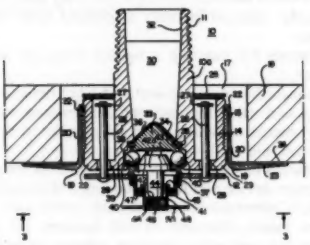
FLUSH PENDANT OR FLUSH HORIZONTAL AUTOMATIC SPRINKLER HEAD

George S. Pieczykolan, North Wales, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Continuation-in-part of Ser. No. 440,539, Nov. 10, 1982,. This application Jan. 24, 1983, Ser. No. 460,289

Int. Cl.[3] **A62C** *37/00*

U.S. Cl. 169—38 **12 Claims**



1. An automatic sprinkler head comprising:

a hollow body portion having an inlet at a first end for receiving a fluid and further having an outlet at a second end; said outlet having a seat;

a hollow valve plug having a plurality of balls therein and a plurality of slots through which the balls may travel, said plug engaging said seat in one position of said plug;

a housing having at least one fin, the housing being engaged with the valve plug for movement therewith;

a plunger disposed within the valve plug and the housing, said plunger contacting said balls;

a fusible metal element disposed within the housing and upon which the plunger rests; said balls preventing movement of said plug away from said seat until said element melts;

a deflector plate engaged with the valve plug for movement therewith;

a restraining guide means having at least one guide for guiding movement of the valve plug and the housing as a unit in relation to the seat of the hollow body portion without disengaging from the hollow body portion;

whereby melting of the fusible element permits said valve plug to move away from said seat thus permitting fluid to flow from said inlet to said outlet for discharge and deflection off said deflector plate.

4,508,176

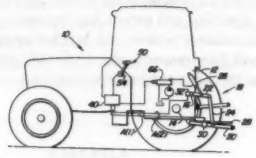
VEHICLE WITH CONTROL SYSTEM HAVING OPERATOR-ACTUABLE SWITCH FOR STORING PARAMETER SIGNAL VALUE TO CONTROL VEHICLE-CONNECTED IMPLEMENT RAISING AND LOWERING STRUCTURE

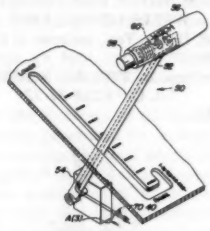
Gordon K. Wiegardt; Thomas W. Hanks, both of Cedar Falls, and Kenneth E. Murphy, Reinbeck, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 22, 1982, Ser. No. 443,415

Int. Cl.[3] **A01B** *63/112*

U.S. Cl. 172—7 **14 Claims**





1. In a vehicle having connecting means for coupling a ground-penetrating implement thereto and actuating means for raising and lowering the connecting means to vary implement ground penetration in response to signals applied to an input thereof, a control system comprising:

a parameter sensing means for generating a parameter signal representing a sensed operating parameter of a machine system comprised of the vehicle and the implement;

an operator-actuatable switch means;

a signal processing unit coupled to the parameter sensor and to the switch means, the signal processing unit comprising means responsive to actuation of the switch means for storing a selected value of said parameter signal for use as a parameter set point value, means for generating a parameter error signal derived from at least a difference between the parameter signal and the parameter set point value, and

means for converting at least the parameter error signal to a control signal and for applying the control signal to the input of the actuating means, the actuating means raising and lowering the connecting means in response to changes in the control signal and at a rate proportional to the magnitude of the control signal.

4,508,177

SOIL PITTING AND DAMMING IMPLEMENT AND PROCESS

Thayne B. Wiser, 236 Hillview Dr., Richland, Wash. 99362

Filed Apr. 29, 1983, Ser. No. 489,803

Int. Cl.[3] **A01B** *35/16, 49/00, 39/12*

U.S. Cl. 172—177 **11 Claims**

1. A tractor drawn soil pitting and damming implement, comprising:

a frame adapted for attachment behind a tractor in transverse orientation thereto:

a series of cultivator shanks transversely spaced along the frame;

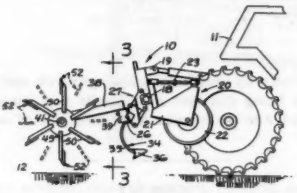
a shaft mounted to the frame behind the cultivator shanks for

free rotation about a transverse axis in relation to the tractor;

spider wheels affixed to the shaft for rotation therewith behind and substantially aligned with the cultivator shanks, having arms extending substantially radially outward to ends;

individual blades mounted to each of the spider wheel arm ends for successive engagement along the ground as the spider wheels rotate in response to motion of the tractor;

wherein the arms of the spider wheel are equiangularly spaced to position the blades angularly apart such that each blade may engage and penetrate the ground behind a



cultivator shank to form a series of longitudinally spaced pits therein in response to forward motion of the tractor;

wherein each blade includes a ground penetrating cutting edge and parallel planar front and back faces, the back face lying in a radial plane passing through the transverse axis to lift and deposit soil rearward of the pits, forming mounds of soil directly behind the pits;

wherein the spider wheels are angularly offset from one another about the shaft axis in succession along the shaft such that the shaft will transfer maximum weight of the spider wheels, shaft and blades carried above the ground surface to a minimum number of blades engaging the ground surface at any given time.

4,508,178

TRACTOR LINKAGE WITH PITCH ALTITUDE CONTROL CONNECTED TO SENSOR RAM

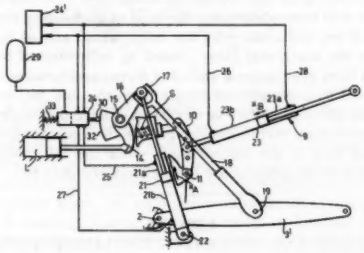
Peter A. Cowell, 41 Chalfont Rd., Oxford, and Paul F. Herbert, 12 Anderson Ave., Rugby, Warwickshire CV22 5PE, both of England

Filed Sep. 27, 1982, Ser. No. 424,302

Claims priority, application United Kingdom, Sep. 28, 1981, 8129222

Int. Cl.³ A01B *63/111*

U.S. Cl. 172—239 **8 Claims**



1. A tractor linkage for coupling a soil-engaging implement to a tractor comprising:

a three-point hitch comprising top and bottom links for towing said implement behind the tractor;

an hydraulic lift ram connected to the links for pivotally raising and lowering the hitch relative to the tractor;

hydraulic control ram means connected to one of said top and bottom links for varying the pitch attitude of said implement relative to said tractor by varying the length of said one link;

hydraulic sensor ram means connected to said hitch and operable in response to forces exerted between said implement and said tractor to detect changes in the pivot angle of said hitch relative to a reference plane on said tractor to produce a displacement of hydraulic fluid; and

hydraulic lines connecting said sensor ram means to said control ram means to feed hydraulic fluid displaced from said sensor ram means to said control ram means thereby to produce said variation in the pitch attitude of said implement.

4,508,179

SOIL CULTIVATING IMPLEMENTS

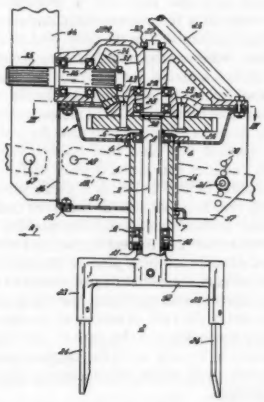
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Jun. 10, 1983, Ser. No. 503,019

Claims priority, application Netherlands, Jun. 11, 1982, 8202359

Int. Cl.³ A01B *33/08*

U.S. Cl. 172—49.5 **21 Claims**



8. An agricultural implement comprising a shaft rotating in bearing means, a rotating tool connected to one end of said shaft, normally outwardly extending means rigidly connected to the other end of said shaft, a bevel pinion connected to said outwardly extending means so that its axis of rotation is substantially coincident with the axis of rotation of said shaft, a gearbox for said bevel pinion secured in a fixed position relative to said bearing means, said gearbox holding a further shaft which is substantially aligned with said first mentioned shaft, said bevel pinion having a central bearing which is arranged to receive said further shaft so that said bevel pinion's axis of rotation is determined by said further shaft, said gearbox being located on top of a frame portion of the implement which accommodates a plurality of intermeshing pinions, the bottom of said gearbox being open and communicating through an opening in the top of the hollow frame portion with the interior of that frame in which said intermeshing pinions are disposed.

4,508,180

CYLINDRICAL GUIDE MEMBER FOR AN IMPACTING MECHANISM IN A HAMMER DRILL

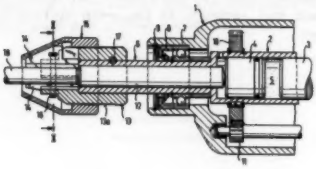
Wilhelm Klueber, Königsbrunn, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Aug. 13, 1982, Ser. No. 407,730

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132450

Int. Cl.³ B25D *9/04*

U.S. Cl. 173—104 **7 Claims**



1. Hammer drill comprising an axially extending cylindrical guide member having a front end and a rear end spaced apart in the axial direction, an impacting mechanism axially displaceable within said cylindrical guide member, a tubular guide member extending axially outwardly from the front end of said cylindrical guide member, a tool holder mounted on said tubular guide member and arranged to hold the shank of a tool and to impart rotational movement to the tool, an anvil axially movably displaceably located within said tubular guide member and having a rear end and a front end spaced apart in the axial direction with the rear end in engagement with said impacting mechanism for transmitting impacting force from said impacting mechanism via the front end to the tool held in the tool holder, wherein the improvement comprises that said tool holder includes means for securing the shank of the tool within said tool holder for securing the shanks of tools having a range of diameter dimensions, said means comprises a plurality of radially displaceable clamping jaws for holding the shank of the tool inserted into said tool holder, said jaws having radially outer surfaces and radially inner surfaces extending in the axial direction of said cylindrical guide member and radially extending rear ends located at the front end of said anvil, said tool holder includes an axially displaceable sleeve having a conically shaped surface in bearing contact with the radially outer surfaces of said clamping jaws so that axial displacement of said sleeve effects the radial displacement of said clamping jaws, the rear ends of said clamping jaws in position clamping a tool are located in the path of said anvil so that said clamping jaws extending inwardly into the path of the front end of said anvil are contacted by said anvil for displacement in the axial direction of said anvil under the impacting force of said impacting mechanism.

4,508,181

DRIVING HEAD FOR PNEUMATIC PILE DRIVERS

Gustav Jenne, Schmachtenberg Strasse 183, 4300 Essen-Kettwig, Fed. Rep. of Germany

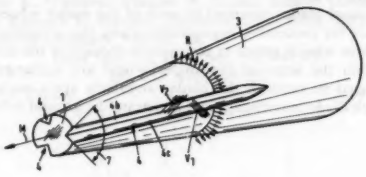
Filed Jul. 15, 1983, Ser. No. 514,181

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1982, 3226568

Int. Cl.³ E21B *11/02*

U.S. Cl. 175—19 **6 Claims**

1. A driving head which can be used for pneumatic pile drivers, and which can serve as an attachment head for rods and pipes which are to be driven in by a pile driver; said driving head comprising an essentially circular front end, and a surface which essentially expands conically from said front end and which is provided with a plurality of longitudinal grooves that start from said front end, that have a V-shaped opening cross section, and that are uniformly distributed over the periphery of said surface; said surface of said driving head being formed of a plurality of conical sections which are offset from one another in the manner of steps as a consequence of jumps in the diameter of said surface, with end faces being formed thereby between respective conical sections, said end faces extending in a circular manner around said surface, being



interrupted only by said longitudinal grooves; said end faces furthermore being disposed at an angle in a range of from 45°–90° relative to the longitudinal center line of said driving head.

4,508,182

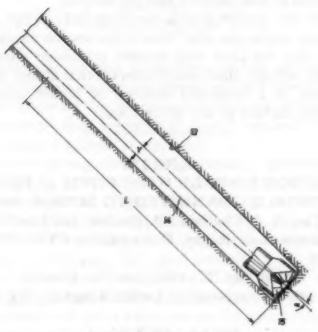
METHOD AND APPARATUS FOR CONTROLLING AZIMUTHAL DRIFT OF A DRILL BIT

Edward O. Anders, Houston, Tex., assignor to Dailey Petroleum Services Corp., Conroe, Tex.

Filed Jul. 20, 1983, Ser. No. 515,199

Int. Cl.³ E21B *7/04*

U.S. Cl. 175—61 **9 Claims**



1. A method of controlling the lateral drift of a drill bit as it drills a well bore comprising the steps of calculating the angle the drill bit will make with the longitudinal axis of the well bore in the horizontal plane caused by deflection of the drill collars from gravitational and axial forces and torsional forces produced by a preselected torque from the drill bit, and prestressing the drill collars in torsion to change the angle in the horizontal plane that the bit makes with the longitudinal axis of the well bore to the desired angle when the drill collars are subjected to the preselected torque from the drill bit.

4,508,183

METHOD AND APPARATUS FOR LUBRICATING A DRILL BIT

Donald D. Drummond, Jasper; Walter F. Johnsey, and Roy W. Wood, both of Birmingham, all of Ala., assignors to Drumco, Birmingham, Ala.

Filed Apr. 7, 1983, Ser. No. 482,907

Int. Cl.³ E21B *21/14*

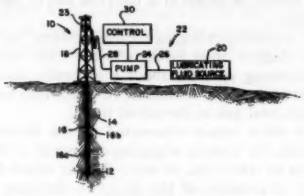
U.S. Cl. 175—69 **18 Claims**

13. A method for providing a flow of lubricating fluid to a rotary drill bit from a surface-mounted lubricating fluid source through a rotatable drill pipe, the drill pipe having a central

conduit for receiving pressurized gaseous fluid from a pressurized gaseous fluid source, the lubricating fluid being conveyed from the drill pipe to rotary cutting cones supported on an adapter subassembly drilling in an underground formation, the adapter subassembly having a plenum chamber therein for receiving gaseous fluid from the central conduit in the drill pipe, comprising:

pumping a flow of lubricating fluid from the lubricating fluid source to the drill pipe;

directing the lubricating fluid through a drill pipe conduit



means separate from the central conduit, and extending along the length of the drill pipe and into conduit means provided in the adapter subassembly;

providing a passageway between the plenum chamber and the conduit means in the adapter subassembly such that gaseous fluid from the plenum chamber enters the conduit means and combines with the lubricating fluid; and

directing the mixture of lubricating fluid and gaseous fluid through a distribution conduit means at the drill bit to the rotary cutting cones of the drill bit for the lubrication of the cutting cones.

4,508,184

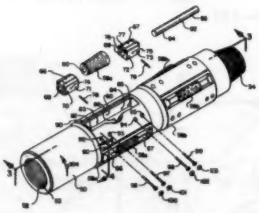
ROLLER REAMER/STABILIZER

Michael S. Hansen, 4694 Lemonwood Circle, West Valley City, Utah 84120

Filed May 27, 1983, Ser. No. 498,868

Int. Cl.[3] **E21B** *10/20, 10/30*

U.S. Cl. 175—346 **19 Claims**



1. A roller reamer/stabilizer apparatus for use on a drill string assembly, said apparatus comprising:

a reamer body having a plurality of pockets formed therein;

a plurality of cutter assemblies, each cutter assembly being adapted for placement into a corresponding pocket of said reamer body, and each cutter assembly comprising a pair of bearing blocks, a reamer cutter, a bearing pin, and means for mounting said bearing blocks and said reamer cutter onto said bearing pin prior to placement of the entire mounted cutter assembly into said corresponding pocket of said reamer body, said means for mounting said bearing blocks and said reamer cutter onto said bearing pin comprising a first pair of pins, said bearing blocks and said bearing pin having receiving means formed therein for receiving said first pair of pins, said first pair of pins being capable of engaging the receiving means of said bearing pin through the receiving means of said bearing blocks, the walls of said reamer body defining said pocket substantially preventing movement of said first pair of pins outside of said bearing blocks when said entire mounted cutter assembly is placed within said pocket; and

means for removably securing each said bearing block in said corresponding pocket after said entire mounted cutter assembly is placed in said corresponding pocket of said reamer body, said means for removably securing each said bearing block in said corresponding pocket corresponding one or more second pins for insertion through said reamer body and said bearing blocks so as to lock each said bearing block in said pocket of the reamer body.

4,508,185

COMBINATORIAL WEIGHING METHOD

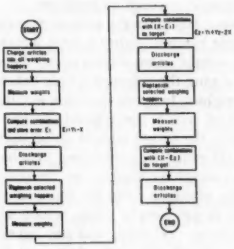
Kazukiyo Minamida, Kouga; Setsuo Haze, Gamou, and Seiji Yamada, Kyoto, all of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusuo, Kyoto, Japan

Filed Sep. 3, 1982, Ser. No. 414,647

Claims priority, application Japan, Sep. 4, 1981, 56-139981

Int. Cl.[3] **G01G** *19/22, 13/02*

U.S. Cl. 177—1 **6 Claims**



1. A combinatorial weighing method in which the weights of groups of articles charged into a plurality of weighing machines having weighing hoppers, are measured to obtain measured weight values, combinations of the measured weight values are formed, the combination whose total weight value is equal to a target weight value or closest to the target weight value within preset allowable limits is selected, and the groups of articles specified by the selected combination are discharged from the corresponding weighing hoppers, said method comprising the steps of:

a. dividing the target weight value into a plurality of divided target values Xi (i=1, 2, . . .);

b. executing processing for the formation of combinations on the basis of the measured weight values with respect to each of the divided target values Xi (i=1, 2, . . .), with groups of articles selected with respect to each of the divided target values not including groups of articles selected with respect to the other divided target values; and

c. discharging the selected groups of articles from the corresponding weighing hoppers after completion of processing for the formation of combinations with respect to all of the divided target values, and charging groups of articles afresh into the weighing machines that have discharged their articles;

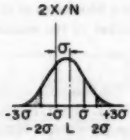
said step b) including the step of computing an error Ej (where j is an integer) between the total weight value of the combination of the groups of articles selected by the j-th processing step for the formation of combinations, and the divided target value Xi serving as the divided target value for said processing step, and the step of adding the error Ej to the divided target value Xi+1 and utilizing the resulting sum as the (j+1)-th divided target value.

4,508,186

WEIGHING METHOD AND APPARATUS THEREFOR

Takashi Sashiki, Nagaokakyo, and Keiko Sakaeda, Kyoto, both of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Jan. 21, 1983, Ser. No. 459,940
Claims priority, application Japan, Jan. 22, 1982, 57-8376
Int. Cl.³ G01G *19/00, 19/22, 19/52*
U.S. Cl. 177—1 18 Claims



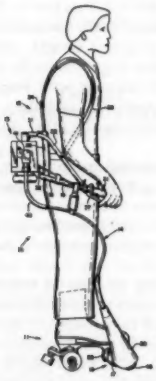
1. A weighing method comprising the steps of:
(a) charging articles to be weighed into a plurality of weighing hoppers;
(b) measuring the weight of each batch of articles received in the respective weighing hoppers;
(c) selecting, based on the measured weights, a combination of article batches giving a total weight value closest to a target weight value within preset limits; and
(d) discharging the selected article batches from the respective weighing hoppers to obtain a collection of articles the weight of which corresponds to the total weight value closest to the target weight value within preset limits;
said step (a) including controlling the charging of the articles into the weighing hoppers on the basis of a target charge quantity, obtained from the number of weighing hoppers and the target weight value, which serves as a target for the charging operation, said step (a) also including charging the articles into each of the weighing hoppers with a weight value of 2X/N serving as the target charge quantity when N is even, and with a weight value of 2X/(N±1) as the target charge quantity when N is odd, where N is the number of weighing hoppers and X is the target weight value.

4,508,187

POWERED ROLLER SKATES

William B. Wenzel, 343 Maitland Dr., Alameda, Calif. 94501

Filed Jul. 12, 1982, Ser. No. 397,504
Int. Cl.³ A63C *17/12*
U.S. Cl. 180—181 3 Claims



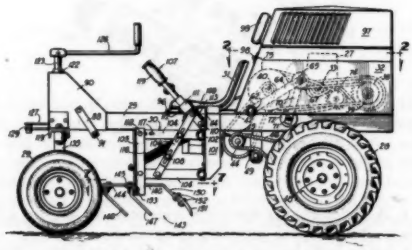
1. A powered roller skate device, comprising:
a motor and means for supporting the motor on a user's body;
a front wheel truck for a two-axel roller skate, with a pair of wheels, and means for removably mounting the front wheel truck on a standard roller skate, interchangeably with a standard two-axel front wheel truck;
flexible drive means extending between the motor and the front wheel truck, having an upper end at the motor and a lower end at the front wheel truck;
clutch means for selectively engaging the motor with the flexible drive means;
gear reduction means at at least one end of the flexible drive means;
drive direction-changing means between the lower end of the flexible drive means and the front wheel truck, for converting rotation about a generally downwardly oriented axis in the flexible drive means into rotation about a horizontal axis at the wheel truck;
wheel drive means connected to the direction-changing means, for directly engaging one wheel of the front truck from its outer side, to drive the one wheel directly at the rate of rotation of the direction-changing means when power is applied from the motor;
the front wheel truck including a rigid bar between the wheels and supporting the wheels for rotation with respect to the bar, means affixed to the rigid bar for supporting the removable mounting means, and strut means secured to the rigid bar and extending laterally outwardly, around the one driven wheel, to a supporting connection with the direction-changing means, positioning the horizontal output axis of the direction-changing means generally coextensively with the axis of the one driven wheel;
ratchet means associated with the wheel drive means, for driving the one wheel when power is applied but for permitting free-wheeling coasting of the one wheel without resistance from the motor when power is cut; and
motor control means for regulating the speed of the motor.

4,508,188

GARDEN AND LAWN TRACTOR

George B. Duke, 252 Kingsale Rd., Suffolk, Va. 23437

Filed May 27, 1982, Ser. No. 383,104
Int. Cl.³ B62D *61/06*
U.S. Cl. 180—210 2 Claims



1. A garden and lawn tractor comprising a main frame including a single high ground clearance center horizontal longitudinal frame bar and a single transverse axis frame bar secured to the longitudinal bar at right angles thereto and extending horizontally on opposite sides of the longitudinal bar, a single center traction wheel assembly beneath and supporting the rear end portion of the longitudinal frame bar, an engine and engine driven drive gearing mounted on top of the rear end portion of said longitudinal frame bar and being disposed above the traction wheel assembly and being drivingly connected with the rear traction wheel assembly, a driver-controlled variable forward and reverse friction belt drive connected in said drive gearing and being operable for selectively drive said traction wheel assembly in forward and reverse

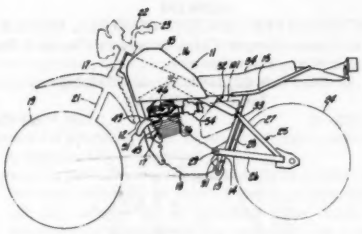
modes at different speeds, a driver's seat on said longitudinal bar immediately forwardly of said engine and drive gearing and near the longitudinal center of the longitudinal bar, a parallelogram mount andlift for diverse implements secured to said transverse axis frame bar and including a driver-operated lever adjacent to one side of said seat to raise and lower said parallelogram mount and lift, said mount and lift being disposed substantially bodily below the elevation of the horizontal longitudinal and transverse frame bars and substantially below said seat, and a pair of front wide stance independently laterally adjustable steering wheels and steering wheel support structure connected with and arranged below and supporting the forward end of said longitudinal frame bar and including a manual steering member in ready reach of a driver occupying said seat.

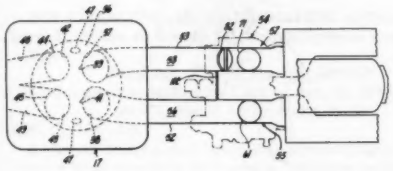
4,508,189

MOTORCYCLE

Hiromi Kato, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Aug. 2, 1982, Ser. No. 403,927
Claims priority, application Japan, Aug. 3, 1981, 56-121734
Int. Cl.³ B62D *61/02*
U.S. Cl. 180—219 **9 Claims**





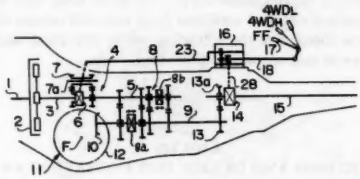
1. In a motorcycle having a rear wheel, a suspension for supporting said rear wheel for relative movement including a single suspension element extending generally in the longitudinal center plane of said motorcycle, a seat supported at least in part above said suspension element, and an engine having a combustion chamber and disposed forwardly of said rear wheel, the improvement comprising said engine having a pair of induction passages serving said combustion chamber, said induction passages lying in side-by-side relationship and extending rearwardly from said engine toward said rear wheel and lying at least in part on opposite sides of said single suspension element, charge forming means for delivering a fuel/air mixture to said induction passages, first and second throttle valves means in respective of said induction passages, and a crossover passage extending between said induction passages downstream of said throttle valves.

4,508,190

SHIFT DEVICE FOR OPERATING A TRANSMISSION FOR A FOUR-WHEEL DRIVE VEHICLE

Shintaro Uchiyama, Fuchu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,823
Claims priority, application Japan, Jun. 9, 1981, 56-88587
Int. Cl.³ B60K *23/08, 41/22;* **F16H** *57/06;* **G05G** *9/08*
U.S. Cl. 180—247 **13 Claims**



1. In a device for operating a transmission for a four-wheel drive vehicle having a first main drive shaft connected to a crankshaft of an engine through a first clutch, an auxiliary transmission provided adjacent to said first main drive shaft, a second main drive shaft provided adjacent said auxiliary transmission, said auxiliary transmission including reduction gear trains and a first shift fork manually operable to select transmitting speeds for transmitting the output of said first main drive shaft to said second main drive shaft, an output shaft provided in parallel with said second main drive shaft, a main transmission provided on said second main drive shaft and said output shaft, two transmitting systems comprising means for transmitting the output of said output shaft to front wheels and rear wheels, respectively, of the vehicle, a second clutch in one of said two transmitting systems for connecting or disconnecting said one transmitting system, a shift rail axially slidably disposed for actuating said first shift fork for said auxiliary transmission, the improvement comprising:

an actuating rail slidably disposed in parallel with said shift rail and rotatably mounted;

a fixed rail disposed in parallel with said shift rail and said actuating rail;

a shift lever operatively connected to said actuating rail and movable in a path having a first path portion so as to slide said actuating rail in a first moving range and in a second moving range and a second path portion so as to rotate said actuating rail between said first and second moving ranges, said second path portion constituting a change of direction with respect to said first path portion;

a second shift fork slidably mounted on said actuating rail and said fixed rail, said second shift fork being operatively connected to said second clutch;

an arm secured to said shift rail and slidably engaged with said actuating rail and said fixed rail;

first interlock means provided between said actuating rail and said second shift fork and the fixed rail for causing said actuating rail and said second shift fork to come into fixed engagement relation to each other within said first moving range of said actuating rail when said shift lever is moved in one part of said first path portion, thereby to shift the second shift fork by operating said shift lever, and for causing said second shift fork and the fixed rail to engage with each other within said second moving range of said actuating rail when said shift lever is moved in another part of said first path portion;

second interlock means between said actuating rail and said arm and said fixed rail for causing said actuating rail and said arm to come into fixed engagement relation to each other within the second moving range of said actuating rail adjacent said first moving range thereby to shift said shift rail, and for causing said arm and said fixed rail to

engage with each other within said first moving range of said actuating rail;

means disposed between said second shift fork and the arm on said actuating rail for moving said second shift fork and said arm respectively, and;

said arm and said second shift fork constitute members, said first and second interlock means being coordinated to said actuating rail such that between said moving ranges one of said interlock means remains effective as in one of said moving ranges, respectively, so as to keep one of said members engaged with said fixed rail until release thereof upon rotation of the actuating rail by operating said shift lever in said second path portion.

4,508,191

METHOD AND DEVICE FOR INITIATING AN UNDERWATER IMPLOSIVE SEISMIC SOURCE

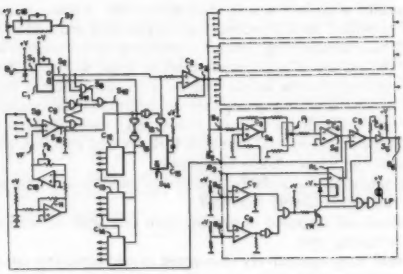
Michel Manin, Sainte-Mesme, France, assignor to Compagnie Generale de Geophysique, Massy, France

Filed Aug. 26, 1983, Ser. No. 526,829

Claims priority, application France, Aug. 30, 1982, 82 14771

Int. Cl.³ G01V *1/00, 1/04, 1/38*

U.S. Cl. 181—107 **6 Claims**



1. A method of initiating an implosive seismic source under the surface of a body of water by creating a shock wave having an implosion peak resulting from an implosion of a cavity of which the internal pressure is less than the hydrostatic pressure, comprising the steps of:

(a) measuring the instantaneous pressure P at the source;

(b) determining, from the measured pressure, a bubble period which will separate a firing signal from the implosion peak;

(c) initiating said source with a compensating time period ΔT equal to a difference between the bubble period corresponding to the instantaneous pressure P and a bubble period corresponding to the mean pressure Po at the source, wherein the compensating period ΔT is determined by the relationship:

$$\Delta T = k \cdot \left(\frac{1}{\frac{5/6}{P_o}} - \frac{1}{\frac{5/6}{P}} \right)$$

k being a constant independent of the pressure.

4,508,192

MICROPHONE DIAPHRAGM

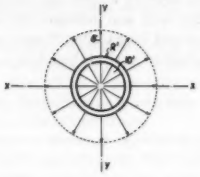
Werner Fidi, Baden; Richard Pribyl, Vienna, and Konrad Wolf, Bad Vöslau, all of Austria, assignors to AKG Akustische u.Kino-geräte gesellschaft mbH, Austria

Filed Mar. 28, 1983, Ser. No. 479,143

Claims priority, application Austria, Apr. 8, 1982, 1402/82

Int. Cl.³ H04R *7/06*

U.S. Cl. 181—158 **7 Claims**



1. A diaphragm for electrostatic and electrodynamic microphones which has a distinct directional pattern, comprising a prestressed diaphragm having a thickness of less than 8 microns and a diameter of less than 10 millimeters and being made of an elastically extensible rubber-base material having a natural frequency in the range of from 1,200 to 1,500 Hz.

4,508,193

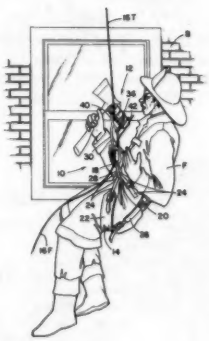
FRICTION-TYPE DESCENT CONTROL DEVICE

William E. Forrest, Denver, Colo., assignor to Charles I. Brown, Evergreen, Colo., a part interest

Filed Feb. 22, 1984, Ser. No. 582,266

Int. Cl.³ A62B *1/16*

U.S. Cl. 182—5 **10 Claims**



1. A descent control device for use with a load-carrying harness suspended therefrom to lower a load on a rope from an elevated position where one end is anchored down to a relatively lower position reached by its free end which comprises: a friction drum of a length adapted to receive a plurality of turns of rope wrapped therearound, said drum having two ends, an arm attached adjacent one of said two ends hanging down beneath the drum and cooperating therewith to define a first rope retaining means effective to prevent the anchored end of the rope from unwinding off said one end when tensioned from above, gated means carried by said arm for connecting same to the load-carrying harness and for receiving and releasably retaining a medial section of the rope without accessing the end thereof; and abutment-forming means positioned adjacent the other of the two drum ends spaced from the arm so as to leave a medial section therebetween to receive the plurality of turns, said abutment-forming means defining a

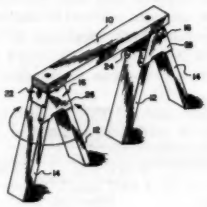
second rope retaining means effective to prevent the free end of the rope hanging therebeneath from unwinding off said other end, and said drum and arm and abutment-forming means all cooperating when supporting a load to leave said other drum end open and permit a slack portion of the rope intermediate its ends to be used to add or subtract turns from said drum while one or more of the turns to remain are squeezed thereagainst tightly enough to prevent slippage.

4,508,194

SAWHORSE AND BRACKET THEREFOR

Wayne L. Freewalt, St. Marys, and Joseph L. Ziegler, Wapakoneta, both of Ohio, assignors to E-Z Buck, Inc., St. Marys, Ohio

Filed Nov. 3, 1983, Ser. No. 548,266
Int. Cl.³ F16M *11/00*
U.S. Cl. 182—153 **15 Claims**



1. For use with a sawhorse of the type having a cross beam and at least two pairs of legs extending downwardly therefrom in supporting relation, an improved sawhorse bracket comprising:

a bracket body;

means for attaching a pair of sawhorse legs to said body in a splayed configuration; and

means for pivotally attaching said body to a cross beam such that said body may be pivoted about a substantially vertical axis relative to an attached cross beam whereby splayed legs attached to said body may be rotated to a storage configuration or to a supporting configuration.

4,508,195

OIL CHANGING AND LUBRICATING APPARATUS

Serge D. Millet, 40 Rongail St., Nepean, Ontario, Canada K2G 0K4

Filed Jun. 2, 1983, Ser. No. 500,459
Claims priority, application Canada, Apr. 22, 1983, 426504
Int. Cl.³ F01M *11/04*; F16N *25/00*
U.S. Cl. 184—1.5 **1 Claim**

1. An oil draining and lubricating system adapted for connection as an accessory to a vehicle having an engine with an oil reservoir and an oil reservoir drain opening and points on said vehicle requiring lubrication, said system comprising:

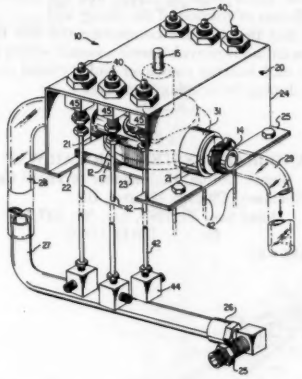
a drill pump having an intake and an outlet and an outwardly extending spindle adapted for engagement and rotation by a hand-held tool to actuate said drill pump;

a housing including a cowling and a base plate enclosing said drill pump therebetween, said cowling having an upper surface with an aperture through which said spindle extends, a first side surface with an opening through which said intake extends and a second side surface with an opening through which said outlet extends, said base plate and cowling being connected together by means of threaded fasteners;

a resilient pad disposed within said housing between said base plate and said drill pump for supporting said drill pump and securely biasing the same between said base plate and cowling;

tubing means connected at one end to the intake of said drill pump and at the other end to said oil reservoir drain opening to permit oil to be pumped from said reservoir, said tubing means comprising a length of flexible tubing leading from said intake and a length of rigid tubing connected at one end to said flexible tubing and adapted at the other end for threaded connection to said drain opening;

a flexible hose leading away from the outlet of said drill pump for disposing of oil drained from said oil reservoir;



a plurality of grease nipples mounted on said upper surface of said cowling; and

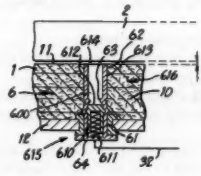
a high pressure flexible tube leading from each of said grease nipples for connection to respective ones of said points on said vehicle requiring lubrication to permit the delivery of lubricant thereto.

4,508,196

WEAR AND LICKING ALARM FOR CROWN OR DISK BRAKE

Jacques Jamon, Cébazat, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Jan. 3, 1983, Ser. No. 455,304
Claims priority, application France, Jan. 18, 1982, 82 00939
Int. Cl.³ F16D *63/00*; G01D *21/02*; B60Q *1/00*
U.S. Cl. 188—1.11 **8 Claims**



1. A monitoring and alarm device for crown or disk brakes, which brakes have a metal crown or disk which is firmly attached to a rotating assembly, for instance a vehicle wheel, and on opposite sides of the crown or disk at least one lining having a friction surface of a material of high coefficient of friction intended to rub on the crown or disk, this device comprising a first electrically conductive feeler arranged in each brake lining with one end thereof intended to come into contact with the crown or disk at a level of maximum wear of the lining and with an other end connected by a line to one pole of an alarm circuit, characterized

by the fact that the first feeler is contained in a first cavity in the lining and comprises a spring exerting its pressure in the direction towards the crown or disk;

by the fact that the end of the first feeler, which is intended to come into contact with the crown or disk at the level of maximum wear of the lining, is immobilized at said level;

by the fact that a second cavity, which extends from the level of maximum wear of the lining to the friction surface of the lining intended to rub against the crown or disk, contains a second electrically conductive feeler electrically connected to and superposed on the first feeler, the second feeler wearing down like the material of high coefficient of friction of the lining; and

by the fact that the line connecting the first feeler to the alarm circuit is provided with a switch which is kept open upon each braking maneuver and is closed at times other than during the braking maneuvers.

4,508,197

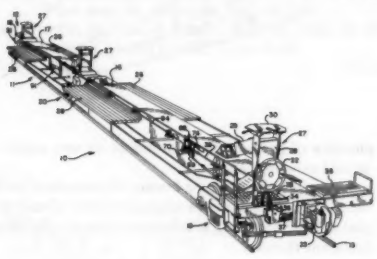
HANDBRAKE SYSTEM FOR RAILWAY CAR

Robert A. Biegel, Dolton, Ill., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Sep. 30, 1983, Ser. No. 537,799

Int. Cl.³ B61H *13/00*

U.S. Cl. 188—47 **14 Claims**



1. A handbrake system for a railway car including at least first, second and third trucks and each truck including a brake mechanism, said handbrake system comprising:

(a) a handbrake with a handwheel;

(b) a force distributor including an input branch, a first output branch and a second output branch;

(c) a first link connecting said handwheel to said input branch for moving said input branch and first and second output branches when said handwheel is moved;

(d) a second link connected to said first output branch and adapted to be connected to the brake mechanism of the first truck;

(e) an automatic slack adjuster;

(f) a third link connected to said second output branch and to said slack adjuster;

(g) a fourth link connected to said slack adjuster and adapted to be connected to the brake mechanism of the second truck; and

(h) a fifth link connected to said slack adjuster and adapted to be connected to the brake mechanism of the third truck;

(i) whereby movement of said handwheel operates through said force distributor to separately operate the brake mechanisms.

4,508,198

SPREADING TYPE DISC BRAKES FOR VEHICLES

Graham J. Gornall, Sutton Coldfield; Anthony G. Price, Birmingham, and David Parry, Solihull, all of England, assignors to Lucas Industries, Birmingham, England

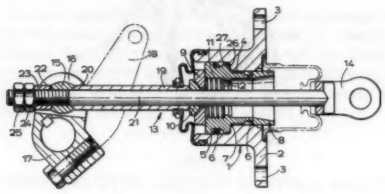
Filed Apr. 29, 1983, Ser. No. 490,199

Claims priority, application United Kingdom, Apr. 30, 1982, 8212585; Nov. 11, 1982, 8232269

Int. Cl.³ F16D *55/18*

U.S. Cl. 188—71.4 **5 Claims**

1. A disc brake for vehicles comprising a housing having a relatively stationary surface, at least one friction disc rotatable within said stationary housing and adapted to be moved into engagement with said relatively stationary surface, and actuating means for moving said disc into engagement with the said surface to apply the brake, said actuating means comprising at least one pressure plate which is located in said housing adjacent to said disc, a reaction member, and balls housed in recesses in said pressure plate and an adjacent face of said reaction member, actuating movement of said pressure plate relative to said reaction member in the plane of said pressure plate being accompanied by axial movement of said pressure plate to urge the friction disc into engagement with said stationary surface, an hydraulic actuator for effecting actuating movement of the pressure plate hydraulically, said hydraulic actuator comprising a cylinder and piston assembly of which the axis is substantially normal to that of the brake and of which one component is fixed relative to said housing and the other is movable, and a spherical rocking thrust coupling through which said movable component acts, a pull-rod passing through the actuator with a substantial clearance and with which said rocking coupling is associated, and said pull-rod is adapted for connection to a manually-operable brake applying device by means of



which said pull-rod can be moved in a brake-applying direction and relative to said cylinder and piston assembly, wherein said movable component has a thrust transmitting face, and said spherical rocking thrust coupling comprises a collar member, and a thrust member disposed between said movable component and said collar member, said thrust member being engageable with said thrust transmitting face on said movable component for sliding movement in a transverse direction with respect to the axis of said piston and cylinder assembly, and a compression spring being provided for biassing said thrust member and said collar member towards each other so that said thrust member is restrained from moving radially with respect to said collar member when brake application is effected by said manually-operable brake applying device, and wherein one of said components has a first spring abutment face, and one of said members has a second spring abutment face which is located adjacent to and spaced from said first spring abutment face, and said compression spring is located between the said one component and the said one member with opposite ends of said spring in abutment with said first and second abutment faces.

4,508,199

BRAKE SHOE

Jean Herbulot, Franconville, and Bernard Jumel, Pierrefitte, both of France, assignors to Valeo, Paris, France

Filed Oct. 21, 1982, Ser. No. 436,196

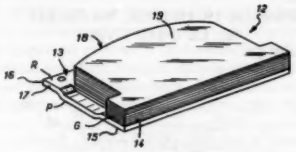
Claims priority, application France, Oct. 30, 1981, 81 20442

Int. Cl.³ F16D *65/08*

U.S. Cl. 188—250 B **11 Claims**

1. A brake shoe comprising a support having opposite faces and a contour including two opposite lateral sides, a friction lining fixed to one of said faces of said support, said friction lining being adapted to cooperate frictionally with a braking surface in response to a force exerted on the other face of said support, each of said lateral sides of said support being adapted to abut against a lateral shoulder, said support having a marginal region extending substantially the full length of each of

said lateral sides of said support, there being a protuberance in each of said marginal regions and protruding beyond the other of said faces of said support, said protuberances extending



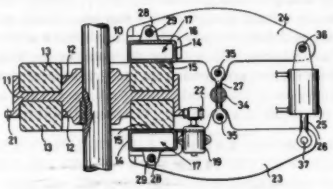
along only a portion of their respective marginal regions, said portions of said marginal regions being devoid of said friction lining, and at least part of the remainder of said marginal regions being covered with said friction lining.

4,508,200

HIGH PERFORMANCE DISC BRAKE

Silvio Cigognini, Milan, Italy, assignor to Socimi, S.p.A., Milan, Italy

Filed Mar. 4, 1983, Ser. No. 472,410
Claims priority, application Italy, Mar. 10, 1982, 20081 A/82
Int. Cl.³ F16D *65/853*
U.S. Cl. 188—264 P **14 Claims**



1. A disc brake to be mounted on a motor vehicle, said disc brake comprising:

(a) a rotating part, which comprises:

a shaft;

a disc, having a seat in at least one of its faces, mounted on said shaft;

an annular friction pad fixed in and projecting from said seat; and

(b) a stationary braking part which comprises:

at least one metal braking head of a high coefficient of thermal conductivity;

a caliper including pivotal members attached to said metal braking head; and

cooling fluid;

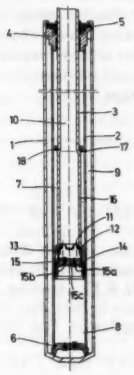
said metal braking head having at least one cavity or duct for the passage of said cooling fluid, said cavity or duct being connected into a cooling circuit communicating with said cavity or ducts, said cooling circuit including a circulation pump fixed on one of said pivotal members, said pump having a pump shaft, and a heater within the interior of the vehicle, said brake disc being provided with peripheral toothing into which a pinion fixed on said pump shaft engages to drive said pump, heat from said metal braking head being dissipated to said cooling fluid located in said cavity or ducts, said cooling fluid circulating within said cooling circuit, said cooling circuit also including a means for directing at least a portion of said coolant fluid into said heater wherein heat from said fluid is dissipated through said heater to the interior of said motor vehicle.

4,508,201

PISTON ROD WITH AN INTEGRAL PISTON FOR A SHOCK ABSORBER

Ludwig Axthammer, Hambach, and Felix Wössner, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed May 26, 1982, Ser. No. 382,368
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123575
Int. Cl.³ F16F *9/34, 9/36*
U.S. Cl. 188—322.19 **12 Claims**



1. In a cylinder piston device comprising a cylinder member having an axis and two end walls comprising a first end wall and a second end wall, a cavity being defined within said cylinder member between said two end walls;

a piston rod axially movable with respect to said cylinder member and extending through said first end wall;

a piston unit provided on said piston rod within said cavity, said piston unit separating said cavity into two working chambers comprising a first working chamber adjacent said first end wall and a second working chamber adjacent said second end wall, said first working chamber being an annular working chamber radially extending between a radially outer surface of said piston rod and a radially inner surface of said cylinder member;

fluid passage means extending between said first and said second working chambers across said piston unit;

the improvement comprising

said piston rod and said piston unit being integrally formed by a piston rod tube;

said piston rod tube comprising a first section close to said second end wall of said cylinder member, having a maximum outside diameter along at least part of its axial length and carrying at least one guiding ring engaging said radially inner surface of said cylinder member;

said piston rod tube further comprising a second section adjacent said first section towards the first end wall of said cylinder member, said second section having a diameter smaller than said maximum diameter, a first shoulder axially directed towards said second end wall being established by the transition from said first section to said second section;

said piston rod tube further comprising a third section adjacent said second section towards said first end wall of said cylinder member, said third section having a diameter smaller than said second section, a second shoulder axially directed towards said second end wall being established by the transition from said second section to said third section;

a partition being axially supported by said second shoulder through an annular sealing member;

a damping member being axially supported by said first shoulder;

said damping member comprising at least one damping passage therethrough;

said second section of said piston rod tube comprising at least one substantially radially directed bore at a location axially between said damping member and said partition, said damping member being preassembled together with said partition into a damping plate-partition unit, said damping plate-partition unit being housed within said piston rod tube, a central passage chamber being defined between said partition and said damping member, said central passage chamber being in fluid connection with said second working chamber by said at least one damping passage and being in fluid connection with said first working chamber by said substantially radially directed bore of said second section.

4,508,202

FULL-STRAP ASSEMBLY FOR TOWING A WHEELED SUITCASE

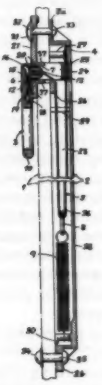
Günter Siegert, Iserlohn, and Ulf Rasch, Altena, both of Fed. Rep. of Germany, assignors to SUDHAUS Schloss- und Beschlagtechnik GmbH & Co., Iserlohn, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,971

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 8300286[U]

Int. Cl.³ A45C *5/14, 13/26*

U.S. Cl. 190—115 **19 Claims**



1. In a suitcase having a wheel base and an end wall provided with a horizontal slit near an upper edge thereof, the combination therewith of a towing device comprising:

a housing extending vertically along an inner surface of said end wall with an opening facing said slit;

a contractile coil spring is said housing anchored to a lower end thereof;

s strap passing through said slit and said opening, said strap being coupled inside said housing to a free end of said spring at a location between said lower end and said slit; and

a handgrip secured to an outer extremity of said strap, said handgrip being integral with a backing plate disposed behind said outer extremity and provided with at least one forwardly projecting pin, said outer extremity having a hole traversed by said pin, further comprising a front flap covering said outer extremity and engaging said backing plate to clamp said strap therebetween.

4,508,203

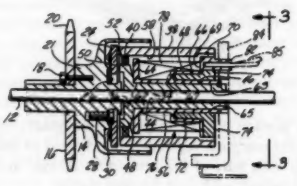
PLASTIC BOBBIN FOR ELECTROMAGNETIC CLUTCH

Gary R. Packard, Horseheads, and Michael L. Mower, Elmira, both of N.Y., assignors to Facet Enterprises, Incorporated, Tulsa, Okla.

Filed Jul. 19, 1982, Ser. No. 399,645

Int. Cl.³ F16D *27/10*

U.S. Cl. 192—84 C **5 Claims**



1. A bobbin for an electromagnetic clutch having a rotating ferromagnetic inner body having a radially flanged and grooved cylindrical outer surface, a coil, and a magnet body, comprising:

a non-magnetic, molded plastic, cylindrical bobbin having a bore slip-fitting upon the cylindrical outer surface of the inner body, an integrally molded radial thrust flange at one end of the bobbin slip-fitting against the radial flange of the inner body and defining an annular coil recess, and integrally molded slip finger means at the other end of the bobbin and projecting inwardly of the bobbin bore and slip-fitting within the groove of the inner body to enable rotation of the inner body relative the bobbin while retaining the bobbin axially relative the inner body; and

said bobbin further comprising an integral extension extending axially away from said annular coil recess and adapted to be mounted to a stationary housing structure.

4,508,204

GRAVITY FEED CHUTE

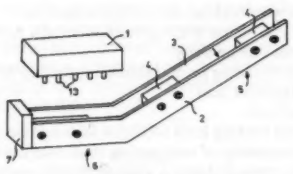
David MacWilliams, Purbrook, and Leonard J. Rigbey, Winchester, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,227

Claims priority, application European Pat. Off., Nov. 30, 1982, 82306349.0

Int. Cl.³ B65G *11/20*

U.S. Cl. 193—40 **1 Claim**



1. A system comprising a plurality of like electrical components and a chute for gravity feeding of said electrical components to a pick-up station for subsequent access and removal by a pick-up mechanism, said electrical components each having a generally cuboid shape and predetermined size and having leading and trailing edges and electrical connection pins (13) extending downwardly from one surface thereof, said chute comprising a downwardly inclined first straight section (5) having a bottom surface, the lower end of said downwardly inclined first straight section leading with an abrupt change in direction into a second straight section (6) serving as a pick-up station from which said electrical components are removed by the pick-up mechanism and having a bottom surface, said

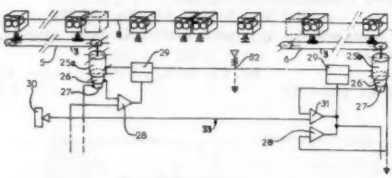
second straight section being closely sized to accommodate only one of said electrical components of predetermined size at a time and said chute further having two identical spaced apart parallel guide rails (2,3) extending upwardly from the bottom surfaces of said first and second straight sections of said chute, said guide rails being chamfered on the upper edges thereof to provide low friction surfaces to support said electrical components and shaped to provide a downwardly inclined straight track (5) within said first straight section adapted to receive at its upper end electrical components fed thereto, said track (5) leading abruptly into a horizontal straight track (6) within said second straight section, the second straight section (6) further having an end stop the electrical components feeding closely adjacent one another throughout the length of the chute and the tangential relationship of the first straight section with respect to the second straight section of the chute establishing a condition wherein the leading edge of any electrical component in the chute next in line to enter the second straight section overlaps the trailing edge of any electrical component in the second straight section, the construction and arrangement of the parallel guide rails being such that they are sufficiently spaced to receive therebetween the pins (13) of electrical components supplied thereto but sufficiently close to each other to support the edges of the surface of the electrical component from which the pins extend, whereby the sliding contact between the pins and guide rails provides lateral restraint and registration for the electrical components as they slide in succession down the chute and into the second straight section and whereby access and removal of an electrical component from the second straight section by the pick-up mechanism by virtue of the overlapping of edges of an electrical component next in line and the constraints on lateral movement established due to the close size relationship of the second straight section and an electrical component in the second straight section imparts a lifting action of the electrical component next in line and aids its free movement into the second straight section.

4,508,205

DOUBLE CABLE FUNICULAR TRANSPORT DEVICE, LOOPED ON ITSELF AND WITH SPEED VARIATION

Michel Aulagner, Paraboin-St Ferreol le Chateau, Near Pont Salomon (Haute Loire), and Jean-Paul Jour, La Merlee, 173 Route d'Andrezieux, St Just St Rambert (Loire), both of France

Filed Dec. 4, 1981, Ser. No. 327,333
Int. Cl.³ B65G *23/00*
U.S. Cl. 198—334 **12 Claims**



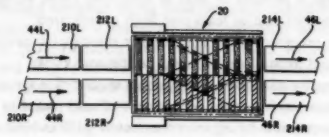
1. A funicular type transportation device comprising:
stationary rail means defining a first continuous loop;
a variation chain comprising a plurality of variation links of variable length, said plurality of variation links being interconnected with each other in a series which is looped back on itself, said variation chain being mounted to said stationary rail means such as to be movable about said first continuous loop;
variation link control means disposed in first predetermined locations relative to said stationary rail means, said variation link control means controlling the length of each variation link of said plurality of variation links in said first predetermined locations such that said variation link control means define a rule of speed for said plurality of variation links on said variation chain as said variation chain travels about said first continuous loop, said variation link control means defining at least one high speed zone of said first continuous loop;
tractor means disposed adjacent said at least one high speed zone of said first continuous loop, said tractor means comprising at least one cable forming a second continuous loop, a portion of said at least one cable being disposed adjacent said at least one high speed zone;
drive means driving said tractor means at a predetermined speed around said second continuous loop;
a plurality of mobile components spaced along said variation chain, each mobile component of said plurality of mobile components being interconnected with at least one variation link of said plurality of variation links, the spacing of adjacent mobile components of said plurality of mobile components along said variation chain being determined by the various lengths of said plurality of variation links, such that the instantaneous velocity of any one mobile component of said plurality of mobile components relative to an adjacent mobile component of said plurality of mobile components is determined by said rule of speed;
a plurality of controllably operable interconnection means for interconnecting said plurality of mobile components with said tractor means, each interconnection means of said plurality of controllably operable interconnection means being controllably operable for interconnecting an associated mobile component of said plurality of mobile components with said at least one cable such that said associated mobile component is driven by said at least one cable;
actuation means disposed in at least one second predetermined location relative to said stationary rail means, said at least one second predetermined location being at an upstream end of said at least one high speed zone, said actuation means being controllably operable for actuating each interconnection means of said plurality of controllably operable interconnection means when the associated mobile component associated therewith passes said at least one second predetermined location as said variation chain travels along said first continuous loop, such that said interconnection means of said associated mobile component interconnects said associated mobile component with said at least one cable as said associated mobile component passes said at least one second predetermined location;
deactuation means disposed in at least one third predetermined location relative to said stationary rail means, said at least one third predetermined location being located at a downstream end of said at least one high speed zone, said deactuation means being controllably operable for deactuating each interconnection means of said plurality of controllably operable interconnection means when said associated mobile component passes said at least one third predetermined location as said variation chain travels along said first continuous loop, such that said interconnection means of said associated mobile component disconnects said associated mobile component with said at least one cable as said associated mobile component passes said at least one third predetermined location;
sensor means measuring the force of said variation link control means on said variation chain; and
control means responsive to said sensor means such as to control said drive means in a manner to maintain said force of said variation link control means on said variation chain below a predetermined maximum level.

4,508,206

CONVEYOR AND SORTING SWITCH

John W. Moore, Dallas, and William M. Thomas, Garland, both of Tex., assignors to Stewart Systems, Inc., Plano, Tex.

Filed Nov. 29, 1982, Ser. No. 445,015
Int. Cl.³ B65G 47/46
U.S. Cl. 198—365 13 Claims



11. In a sorting switch of the type including a plurality of pallets each mounted for movement around a closed course and for transverse movement relative to the course to effect article sorting, wherein said closed course includes an upper article sorting portion and a lower pallet return portion, the improvement comprising:

a plurality of tubular pallet support members;

each pair of said pallet support members individually supporting one of said pallets for movement around said course and for transverse movement relative to said course;

means supporting said pallet support members for sequential movement around said closed course;

said pallets normally being positioned in alternating sequence in alignment with adjacent first and second article conveying paths at the outset of movement through said upper article sorting portion of said closed course of movement, wherein at least two successive pallets of each of said first and second article conveying paths support each article introduced to their respective conveying path, such that the carrying capacity of said sorting switch, in terms of the number of articles carried through each of said conveying paths, is maximized by allowing the simultaneous transport of articles ordered in a close-packed random sequence on each of said first and second article conveying paths and such that said sorting switch is suitable for application with articles having widely differing sizes, shapes and lengths; and

means for selectively moving each pallet on its respective pallet support members in a direction transverse relative to said upper article sorting portion of said closed course of movement and into alignment with the adjacent article conveying path and into alignment with the adjacent article conveying path during passage thereof through said upper article sorting portion.

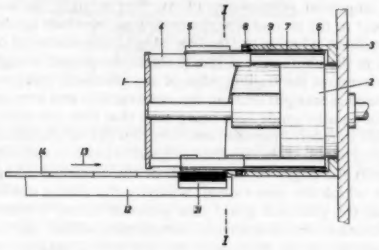
4,508,207

CIGARETTE HANDLING APPARATUSES

Manfred Oberdorf, Gevelsberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Continuation of Ser. No. 962,257, Nov. 20, 1978, abandoned. This application Nov. 24, 1980, Ser. No. 209,358
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1977, 2751760
Int. Cl.³ B65G 29/00
U.S. Cl. 198—478 9 Claims

1. Cigarette handling apparatus for transferring cigarettes from a first stream, in which they move at a first speed one after the other in a first direction substantially parallel to their axes, to a second stream, in which they move at a second speed one after the other in a second direction substantially at right angles to their axes, the apparatus comprising a transfer drum mounted to be rotatable at a constant speed about an axis of rotation parallel to said first direction; a plurality of cigarette carrier elements each slidably mounted around the periphery of said drum for reciprocating movement parallel to said axis of rotation and each movable rotationally by the drum between a first position for lateral entrainment by suction of at least one cigarette from said first stream and a second position for delivery of said entrained cigarette to said second stream; roller cam follower means mounted on each of said carrier elements; and a cam mounted to be stationary relative to said drum and having means defining an endless cam track extending around the periphery of said drum intermediate the axial ends thereof; said cam track being so arranged as to impart to each said carrier element by way of said roller cam follower means one reciprocation parallel to said axis of rotation in each revolution of said drum and the configuration of said cam



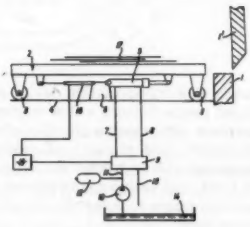
profile being such that during rotation of said drum at said constant speed each of said carrier elements, when at said first position, is slidably displaced along the drum in a direction parallel to said first direction and at a speed which is at least approximately equal to said first speed, and said slidable displacement of each carrier element being thereafter so progressively decelerated as to be at a speed substantially less than said first speed when the carrier element is at said second position, whereby said transfer of the cigarettes from said first stream to said second stream is carried out in such a manner that the speed of each cigarette in its axial direction is subject to progressive deceleration during the deceleration of said carrier elements.

4,508,208

APPARATUS AND METHOD FOR MOVING MATERIALS

John R. Preedy, Derby, England, assignor to Thos. Hill & Company Limited, Derby, England

Filed May 5, 1982, Ser. No. 375,259
Claims priority, application United Kingdom, May 12, 1981, 8114464
Int. Cl.³ B65G 25/00
U.S. Cl. 198—751 8 Claims



1. Material moving apparatus including:

a conveyor for carrying material;

reversible hydraulic means for moving the conveyor in forward and reverse directions;

control means for controlling the supply of operating fluid to the reversible hydraulic means;

a position sensor for providing signals representative of the position of the conveyor with respect to a fixed point; and electronic processing means for receiving and storing information relevant to the material on the conveyor, and responsive to signals from said position sensor and to said information for operating the control means,

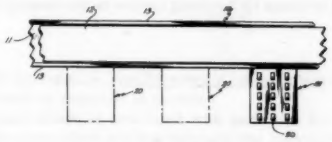
whereby the positive or negative acceleration of the conveyor is controlled to cause, as desired, controlled relative movement between the material on the conveyor and the conveyor.

4,508,209

ACCESSORY ATTACHMENT FOR CONVEYORS

Bruce Whitman, Lowell, Mich., assignor to Lear Siegler, Inc., Grand Rapids, Mich.

Filed Oct. 11, 1983, Ser. No. 540,316
Int. Cl.³ B65G *21/06*
U.S. Cl. 198—583 **12 Claims**



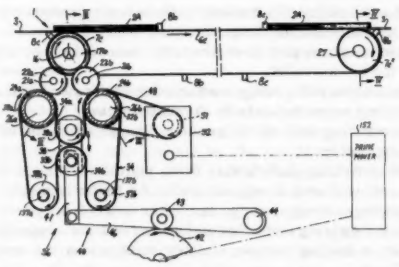
1. An attachment for detachably mounting an accessory to the side rail of a conveyor, the side rail having a vertical web and the accessory having a vertical flange adapted to seat against the web, a vertically elongated aperture in said side rail; means secured to said flange having upper and lower stops spaced the vertical length of said aperture, a resilient member secured to the lower stop and flange and projecting below said lower stop and spaced from the flange to receive and clamp said web between it and said flange; the accessory projecting outwardly from said rail and having an element spaced from the rail supporting the outer end thereof when said stops are seated in said aperture and the lower one thereof is seated on the web at the lower end of said aperture.

4,508,210

APPARATUS FOR TRANSPORTING PAPER STACKS OR THE LIKE

Bernd Ramcke, Hamburg, and Günther Stahl, Rellingen, both of Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,855
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1982, 3205138
Int. Cl.³ B65G *15/14*
U.S. Cl. 198—627 **12 Claims**



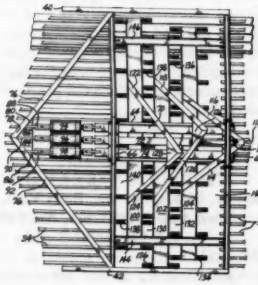
1. Apparatus for stepwise transport of several files of discrete commodities in a predetermined direction and along a predetermined path, particularly for transporting stacks of paper sheets or the like, comprising a housing; a battery of neighboring transporting units each including a self-sustaining frame mounted in said housing, more than two endless parallel conveyors each having at least one projection arranged to extend into and from said path in response to movement of the respective conveyor in said direction, said conveyors including a first group having at least one conveyor whose projection is located ahead of and a second group having at least one conveyor whose projection is located behind a commodity in said path, first and second rotary elements for each of said conveyors and each conveyor being trained over the respective rotary elements, and first and second shaft means mounted in the frame and rotatably supporting the first and second rotary elements; and common drive means for said conveyors including first and second gear means for respectively rotating the rotary elements for said first and second groups of conveyors, first and second driver gears respectively meshing with the first and second gear means of said units, and means for intermittently rotating said driver gears including a third shaft arranged to drive said fist gear means via said first driver gear, a fourth shaft arranged to drive said second gear means via said second driver gear, stepping motor means arranged to intermittently rotate said third and fourth shafts, and transmission means interposed between said motor means and said third and fourth shafts, said transmission means including means for intermittently changing the angular position of one of said third and fourth shafts with reference to the other of said third and fourth shafts to thereby change the spacing between the projection of each conveyor in one of said groups and the projection of each conveyor in the other of said groups so that the projections of the conveyors of said groups are spread apart or moved nearer to each other to thus permit delivery of commodities into and predictable transport of commodities along said path, the axes of said rotary elements, said gear means and said driver gears being normal to said direction and the entire frame of at least one of said units being adjustable with reference to said housing in parallelism with said axes, the axial length of said driver gears being such that the first and second gear means of said one unit remain in mesh with the corresponding driver gears in all positions of adjustment of the frame of said one unit.

4,508,211

RECIPROCATING FLOOR CONVEYOR APPARATUS AND METHOD

R. Keith Foster, P.O. Box 1, Madras, Oreg. 97741

Filed Feb. 8, 1982, Ser. No. 346,864
Int. Cl.³ B65G *25/04*
U.S. Cl. 198—750 **13 Claims**



1. A modular drive unit for a reciprocating floor conveyor, comprising:

a frame;

a plurality of longitudinal drive beams mounted on said frame for longitudinal reciprocation;

a plurality of transverse drive beams, one for each longitudinal drive beam, said transverse drive beams extending

across the longitudinal drive beams, and each being connected to a related one of the longitudinal drive beams where the two of them cross;

a source of drive power for each longitudinal drive beam, interconnecting such drive beam with the frame;

connector means on upper portions of each transverse drive beam for securing thereto a plurality of elongated floor members; and

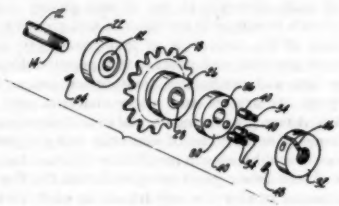
a generally horizontal reinforcing truss interconnected between each transverse drive beam and its longitudinal drive beam below the drive unit, each said truss comprising a pair of diagonal beams having inner ends which are connected to the longitudinal drive beam and outer ends which are connected to the associated transverse drive beam, at locations spaced laterally outwardly from the longitudinal drive beam, on opposite sides thereof.

4,508,212

ADJUSTABLE TORQUE CONVEYOR ROLLER DRIVE

Fred Bolle, Pontiac; John R. Herronen, Linden, and Joseph M. Wright, Fenton, all of Mich., assignors to Tek-Matik, Inc., Howell, Mich.

Filed Sep. 30, 1982, Ser. No. 430,548
Int. Cl.³ B65G *13/06*
U.S. Cl. 198—781 **10 Claims**



1. In a roller conveyor apparatus of the type including an axle shaft having a threaded end, a roller on the shaft and rotating therewith, a drive sprocket slidably mounted directly on the shaft and variably frictionally couplable to the shaft by way of a thrust pad and a back-up pad non-slidably mounted directly on the shaft and abutting axially opposite faces of the sprocket, and a nut threaded on the shaft end to control the frictional coupling between the sprocket and pads according to the axial position of the nut, the improvement which comprises:

a plurality of compression springs operatively disposed in uniformly circumferentially spaced relation axially between the nut and the adjacent thrust pad at a radially outwardly predetermined distance from the axis thereof to apply compression force to urge the thrust pad against the sprocket according to the axial position of the nut on the threaded shaft end.

4,508,213

HYDRAULIC TAKE-UP DEVICE

Hugh D. Kelley, 56 Mayfair Dr., Bella Vista, Ark. 72712

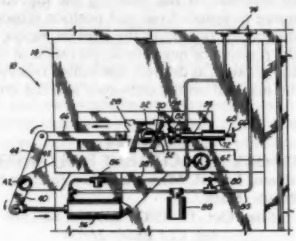
Filed Aug. 1, 1983, Ser. No. 519,034
Int. Cl.³ B65G *23/44*
U.S. Cl. 198—813 **6 Claims**

1. A hydraulic take-up device for applying constant and adjustable pressure on a pair of bearing housings having a take-up bearing mounted on the ends of a take-up shaft, the shaft receiving one end of an endless conveyor belt or chain thereon, the device comprising:

an eccentric mounted on one end of the take-up shaft:

a hydraulic pump having a piston, the piston biased against the eccentric and driven thereby as the take-up shaft rotates;

a hydraulic cylinder operated by the hydraulic pump through a hydraulic fluid supply line; and



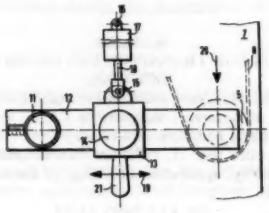
linkage means connected to the hydraulic cylinder and the bearing housings for applying tension on the bearing housing.

4,508,214

TIGHTENING MEANS FOR AT LEAST ONE PRESSER BELT ASSOCIATED WITH A TAIL PULLEY OF A CONTINUOUS SHEET FEEDER

Emil Klenk, and Karl-Fritz Heina, both of Murrhardt, Fed. Rep. of Germany, assignors to Maschinenbau Oppenweiler Binder GmbH & Co., Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,440
Claims priority, application Fed. Rep. of Germany, May 17, 1982, 3218566
Int. Cl.³ B65G *23/44*
U.S. Cl. 198—833 **4 Claims**



1. A tightening means for at least one presser belt associated with a tail pulley of a continuous sheet feeder comprising:

a tension roller for the presser belt,

at least one support-lever pivotally connected at one end to the tension roller,

the tension roller being unattached to the feeder frame and being supported only by the support-lever,

a swivelling shaft rigidly connected to the other end of the support-lever,

the swivelling shaft further being pivotally mounted adjacent each end to opposite walls of a feeder frame,

a spring connected at one end to the feeder frame,

the spring being connected at the other end to a tension lever by a holding member slidably arranged on the tension lever,

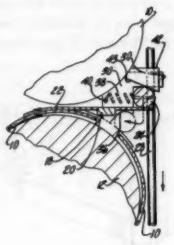
the tension lever being rigidly connected at one end to the swivelling shaft outside the feeder frame,

whereby the holding member can be placed at variable distances from the swivelling shaft to vary the tightening force on the presser belt as desired.

4,508,215
AMMUNITION LOCKING MECHANISM

Richard L. Swarthout, Wayne, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 15, 1983, Ser. No. 485,358
Int. Cl.[3] F42B *37/00*
U.S. Cl. 206—3 3 Claims



1. In combination, parallel rows of tubes for storing individual rounds of ammunition therein;

a clamp structure associated with each tube for movement between a first position retaining the associated round in the tube, and a second position releasing the associated round for removal from the tube;

a stationary guide means (30) associated with each clamp structure, each stationary guide means terminating in a latch structure (34, 36);

each clamp structure comprising a spring leaf attached at one end thereof to an ammunition storage tube, a round-engagement pad carried by the leaf spring, a manually operable arm extending approximately parallel to the tube axis in crossing relation to the associated leaf spring, said arm being swingably mounted for motion along the associated guide means to and from a captured position engaged with the latch structure, and tension spring means (38) connected to each swingable arm for pulling said arm against the guide means and into the latch structure; said arm having pressure contact with the leaf spring so that when the arm is engaged with the latch structure the associated pad is in its round-retaining position; said leaf spring having a pre-stress therein which causes said leaf spring to move the associated pad to a round-released position when the swingable arm is disengaged from the latch structure;

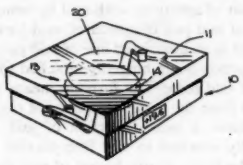
and reciprocatable gang type actuator means for operating the clamp structures in each row of tubes to their round-retaining positions; each gang type actuator means being movable from a first standby position in which all clamp structures in the row are permitted to be in their round-released positions to a second locked position in which all clamp structures in the row are in their round-retaining positions;

each gang type actuator means comprising an elongated bar extending between two rows of ammunition storage tubes for longitudinal motion normal to the storage tube axes, and multiple cams carried by the bar at spaced points along the bar length, each cam defining a cam surface obliquely angled to the bar longitudinal axis; each cam having a motion path passing through an associated swingable arm, whereby motion of the elongated bar in one direction enables the cam to move the associated arm along the aforementioned guide means and into its captured position engaged with the latch structure, said cams being disengagable from the associated arms whereby motion of the elongated bar in the opposite direction frees said arms for manual motion out of their captured positions engaged with the latch structure.

4,508,216
HOUSING FOR AN INTRAOCULAR LENS AND METHOD OF USING THE SAME

Charles D. Kelman, The Empire State Bldg., 350 Fifth Ave., New York, N.Y. 10118

Filed Jul. 14, 1983, Ser. No. 513,682
Int. Cl.[3] A61F *1/16, 1/18;* B65D *25/54;* G01F *23/00;* G02B *27/00*
U.S. Cl. 206—5.1 14 Claims



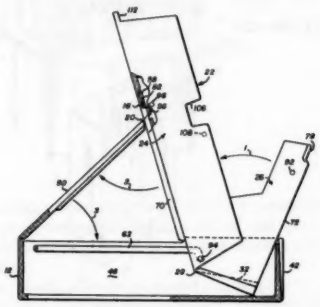
1. A housing for an intraocular lens having an optic comprising:

at least a pair of opposed walls adapted to enclose the lens within the housing, said walls comprising lens means having an optical power which is substantially of the same magnitude as but opposite in sign to the optical power of the lens intended to be housed and said lens means being positioned substantially to coincide with the optic of the housed lens when viewed along the optical axis thereof so that a viewer can see through said lens means of the housing and through the lens housed therein without substantial distortion if the intended lens is in the housing.

4,508,217
STORAGE CONTAINER AND DISPLAY DEVICE

Jerry M. Long, Scotts Valley, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.

Filed Nov. 19, 1981, Ser. No. 322,968
Int. Cl.[3] B65D *85/57*
U.S. Cl. 206—45.18 7 Claims



1. A storage and display unit for floppy diskettes and the like, comprising, in combination:

(a) a base portion including receptacle forming means for providing a receptacle having an open top defining a center, a lower region and an upper periphery, said receptacle forming means provided with a support portion hingedly attached to said upper periphery and arranged for extending toward said center of said receptacle means, said support portion including an elongated portion extending from said receptacle forming means and terminating in a locking means, a living hinge formed in said support portion immediately adjacent said locking means for

hingedly separating same from said elongated portion; said locking means including a transverse bar portion having spaced ends provided thereon with a pair of locking tabs, and a lip extending from said bar portion and away from said elongated portion;

(b) an upper part including a first portion provided with a pair of adjacent apertures, a transversely extending bar disposed separating said pair of apertures, said apertures being arranged to receive said locking means, said bar portion of said locking means being receivable in one of said pair of apertures with said lip being retainable in the other of said pair of apertures, said locking tabs retaining said bar in an associated one of said pair of apertures, said first portion being hingedly attached to said support portion of said receptacle forming means at a point thereon spaced from the upper periphery of said receptacle forming means, a second portion of said upper part being hingedly attached to said first portion at a point spaced from the point of attachment of said first portion to said receptacle forming means and arranged for rotation between a position common to said first portion and a position extending away from said first portion, said upper part being arranged for rotation relative to and in cooperation with said support portion between a position within said receptacle forming means and a position extending away from said receptacle forming means; and

(c) guide means associated with said receptacle forming means and said upper part and formed integrally therewith for directing movement of said upper part relative to said receptacle forming means between said position within said receptacle forming means and said position extending away from said receptacle forming means.

4,508,218

SOFT CIGARETTE PACK

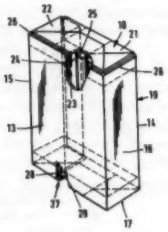
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Continuation of Ser. No. 383,072, May 28, 1982,. This application Jul. 15, 1983, Ser. No. 513,958

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124118

Int. Cl.³ B65D *85/10*

U.S. Cl. 206—271 **8 Claims**



1. A package made of a foldable packaging material, comprising; at least one main blank forming front, rear and side walls and bottom and end walls, said main blank being transversely wrapped and being provided with reinforcement portions comprising Z-folds extending along upper and lower edge portions of said front, rear and side walls, said Z-folds being disposed on the inside of the package and terminating at upper and lower edges flush with respective upper and lower edges of a package envelope formed by said front rear and side walls, portions of said blank extending directly from termination lines of said Z-folds extending over upper and lower faces of said package.

4,508,219

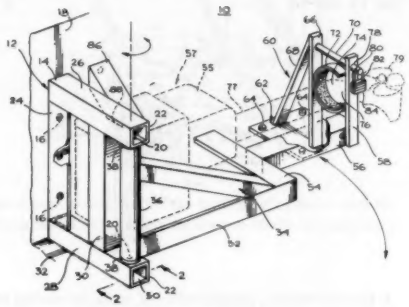
SECURITY SAFETY CRADLE

Hector C. O'Neill, 9900 Jovita Ave., Chatsworth, Calif. 91311

Filed Jun. 9, 1983, Ser. No. 502,557

Int. Cl.³ B65D *85/68*

U.S. Cl. 206—319 **6 Claims**



1. An improved security safety cradle for outboard motors and the like, said cradle comprising, in combination:

a. a transversely extending upright pivot brace securable at one end thereof to a support structure and bearing pivot points adjacent the opposite end thereof, said pivot brace comprising an upright member and a pair of transverse members secured to opposite ends of said upright member, said transverse members bearing aligned pivot points at their free ends;

b. an elongated support arm having a motor-securing portion, said support arm comprising an upright front pivot bar, a side support member connected to said pivot bar, a bottom portion connected to said side support member, and an upright post secured to the end of said arm which is remote from said pivot bar, said arm being pivotally secured to said pivot brace by said pivot bar at said pivot points and rotatable around said pivot brace between a forward secured position and a rearward release position;

c. a stop and lock bracket securable to a support structure in front of said pivot brace and engageable with said pivot arm at about the forwardmost position on said pivot arm, for releasable securing of an outboard motor enclosed by said pivot arm, said bracket comprising an upright member, a transverse bar connected at one end thereof to said upright member and a transverse C-shaped member connected to said upright member below said transverse bar, said C-shaped member having an opening adapted to receive the drive shaft of an outboard motor, said transverse bar extending through an opening in said upright post of said support arm when said support arm is in its forwardmost position, said upright post being alignable with said bracket; and,

d. means for securing said brace and bracket to a support structure.

4,508,220

U-CLIP ASSEMBLY AND METHOD OF PRODUCING AND UTILIZING THE SAME

Kenneth C. Pearson, Glenview, Ill., assignor to Hartco Company, Skokie, Ill.

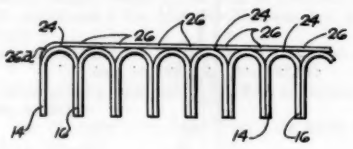
Continuation-in-part of Ser. No. 366,790, Apr. 9, 1982,. This application Mar. 6, 1984, Ser. No. 586,669

Int. Cl.³ B65D *71/00*

U.S. Cl. 206—343 **5 Claims**

1. A clip assembly for use with a clinching tool capable at high speeds of sequentially severing and wrapping a clip on overlying wire members employed in the manufacture of furniture, bed springs, and the like, to secure the members together,

comprising: a plurality of generally U-shaped sheet metal clips having an arcuate crown portion and depending leg portions integrally joined in spaced relation to one another to the transverse margins of the crown portion, the clips being arranged in abutting, or near abutting, aligned relation to one another with the transverse axis of the crown portions substantially normal to the longitudinal axis of the clip assembly; and a pair of metal wires for maintaining the clips in positive, fixed abutting, or near abutting, aligned relation to one another, said pair of metal wires being positioned in spaced relation to one another



and being secured in point contact with and substantially tangential to the crown portion of each of the clips of the assembly by a metal-to-metal bond in a manner both to prevent the disruption of the positive, fixed, aligned relation of the clips when the clips are subjected to a pulling or tension force and to provide severable clip spanning portions which freely extend between the metal-to-metal bond formed by said pair of metal wires with the crown portion of each clip to enable each clip to be sequentially severed and wrapped by a clinching tool on overlying wire members of a workpiece.

4,508,221
TOOL CADDY
David V. Olson, 324 IDS Tower, Minneapolis, Minn. 55402
Filed Sep. 21, 1981, Ser. No. 303,887
Int. Cl.³ B65D *5/28*
U.S. Cl. 206—379 **6 Claims**

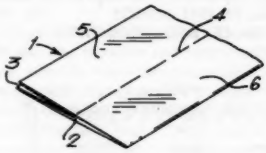
1. A tool caddy for holding a plurality of small tools of varying sizes, said caddy comprising:

(A) a flat base sheet of flexible material,

(B) a flexible corrugated s' :et of resilient material on the upper surface of said base sheet, said corrugated sheet having alternating parallel ridges and furrows, the ridges of which form a plurality of open-ended parallel spaced apart longitudinal tool-receiving pockets and the bottom surfaces of the furrows of which are sealed to the top surface of said base sheet, and

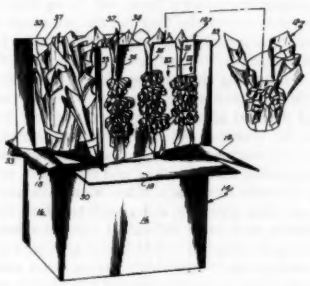
(C) means for securing said tool caddy to the housing of a portable hand power tool.

4,508,222
PLASTIC BAGS
Francis S. O. Choe, Singapore, Singapore, assignor to 501 Lamipak Industries (Europe) Ltd., London, England
Filed Mar. 5, 1984, Ser. No. 586,338
Claims priority, application United Kingdom, Mar. 16, 1983, 8307213
Int. Cl.³ B65D *30/10, 33/00*
U.S. Cl. 206—390 **12 Claims**



1. A thermoplastic bag having a gusset on one side only, the gusseted and ungusseted sides being completely or partially folded over one another along a longitudinal axis and sealed together across the bottom of the bag.

4,508,223
PREFORMED POT COVER PACKAGE
Joel Catrambone, Rancho Cucamonga, Calif., assignor to A. J. Sparks & Company, Grand Rapids, Mich.
Filed Nov. 14, 1983, Ser. No. 551,108
Int. Cl.³ B65D *85/50, 85/52*
U.S. Cl. 206—423 **3 Claims**



1. In a package supporting a plurality of preformed pot covers nested in vertical columns, each of said pot covers having a body portion with a bow attached thereto, said package comprising:

a container having a floor, sides and a cover;

at least one panel for positioning in said container, wherein said panel includes a floor member and two side members attached thereto and extending upwardly from opposite sides thereof, said panel further including a plurality of elongated, spaced, parallel, vertically extending slots located in said side members thereof, said slots receiving the bow on one side thereof and the body on the other side thereof, whereby each of said slots support a vertical column of nested pot covers and said panel supports a plurality of vertically extending columns of nested pot covers in spaced relationship along said floor member; and

spacing means connected to said panel for positioning said side members a predetermined distance from the sides of said container.

4,508,224
CONTAINER FOR PHOTOGRAPHIC FILMS AND PRINTS

Klaus Weber, Leverkusen; Friedrich Hujer, Grünwald, and Ferdinand Schaner, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaret Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 885,115, Mar. 10, 1978, abandoned. This application Sep. 28, 1981, Ser. No. 306,391
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2716011; Jul. 31, 1981, 3130375
Int. Cl.³ B65D *27/08, 27/10*
U.S. Cl. 206—455 **17 Claims**

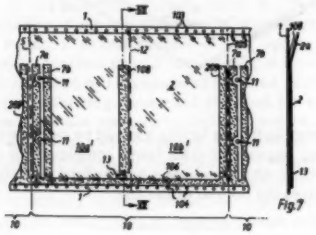


Fig.7

1. An elongated strip comprising a plurality of containers, each container having at least two open and distinct compartments, one for developed film and the other for prints of a customer order, said strip being constituted by two superimposed elongated sheets each having two marginal portions and generally uniform width, each of said compartments having four marginal edges, three of said marginal edges being formed by securing the two sheets together, the fourth marginal edge of each compartment being open and being disposed at one side of said strip so that the film and the prints can be inserted in appropriate compartments from said one side, two of said three marginal edges being adjacent said open fourth marginal edge and terminating short of said fourth marginal edge and said strip further having a tear line between each of said containers and the next adjacent container, said tear lines extending across the width of the two sheets, as considered transversely of said marginal portions, and said strip also having a fold line extending across each of said containers, said containers being foldable over each other along the tear lines for handling and then separable along such tear lines into individual containers, each such individual container being in turn foldable along the respective fold line to provide a plural-compartment wallet, one of said sheets having along and in at least one of its marginal portions a row of equidistant perforations and the width of the other sheet being less than that of said one sheet to leave exposed at least one marginal portion of the one sheet at said open fourth marginal edges of said compartments.

4,508,225
CONTAINER DISPLAY PACKAGE

Luigi M. Ferrari, Douglaston Hills, N.Y., assignor to Del Laboratories, Inc., Del.

Filed Dec. 9, 1983, Ser. No. 559,940
Int. Cl.³ B65D *73/00*
U.S. Cl. 206—461 **8 Claims**

1. A display package for a container having a central axis and including a receptacle having axially spaced closed and open ends, and a cap removably mounted on the open end to close the same and having at a region of its periphery which is close to the receptacle at least one retaining formation that is spaced a different radial distance from the central axis than the remainder of the periphery and moves in a predetermined trajectory during attempted removal of the cap from the receptacle, comprising:

a substantially sheet-shaped backing element; and

means for mounting the container in a predetermined position on the backing element, including

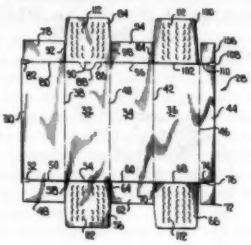
a substantially cup-shaped first mounting part secured to said backing element and so embracing and accommodating the closed end of the receptacle as to prevent movement of the container radially and in one of its axial directions in which the closed end would lead, and

a substantially annular second mounting part secured to said backing element at a distance from said first mounting part to embrace the cap and having a locking surface that extends into the predetermined trajectory of movement of the formation of the cap, said locking surface and the formation together preventing unnoticeable removal of the cap from the receptacle while the container is mounted on said backing element.

4,508,226
SEALED CARTON WITH TAMPER INDICATING FEATURES

Robert E. Davis, Nutley; Patrick S. Maio, Ringwood, both of N.J., and Lawrence J. Growney, Pearl River, N.Y., assignors to Federal Paper Board Company, Incorporated, Montvale, N.J.

Continuation-in-part of Ser. No. 443,754, Nov. 22, 1982,. This application Jul. 18, 1983, Ser. No. 514,947
Int. Cl.³ B65D *5/54*
U.S. Cl. 206—620 **19 Claims**



1. A carton having a body defined by body panels and two opposite ends defined by closure flaps, said closure flaps being bonded together to resist separation, at least certain of said closure flaps of one of said ends being connected to respective ones of said body panels by rupturable connections for the at least partial tearing of said one end from said carton body as a unit, and said body including a connecting panel carried by one endmost one of said body panels and overlapping and bonded to another endmost one of said body panels, and a terminal flap carried by said connecting panel at an end thereof and bonded to an innermost one of said closure flaps at said one end, said terminal flap being connected to said connecting panel along a fold line which is aligned with and overlaps a portion of a fold line extending between said another endmost body panel and a respective one of said closure flaps, said overlapped fold line

portions being jointly weakened wherein between said two overlapped fold line portions there is a total of approximately only one fold line portion or less which is unweakened whereby tampering with said carton along the connection between said connecting panel and said another endmost body panel to gain entry will result in the separation of said terminal flap from said connecting panel.

4,508,227
COP PREPARATION PLANT

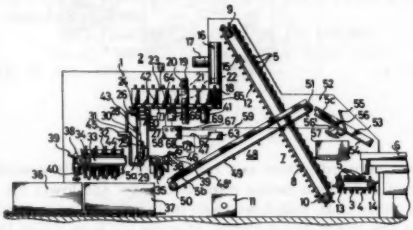
Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Continuation of Ser. No. 327,040, Dec. 3, 1981,. This application Mar. 12, 1984, Ser. No. 587,861

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045825

Int. Cl.[3] **B07C** *5/00;* **B26D** *7/06, 5/28;* **B65H** *59/00*

U.S. Cl. 209—927 **7 Claims**



1. Cop preparation plant for supplying cops with thread ends of a suitable length to be transported to a winding machine, comprising a cycle including first and second cop separating devices, means for removing cops from said first cop separating device, a device disposed down stream of said removing means for locating, drawing off and cutting to length thread ends of a spinning cop, said second cop separating device being disposed down stream of said locating, drawing off and cutting device in travel direction of the cops, for separating spinning cops having thread ends of a substandard length from other spinning cops, and a device disposed down stream of said second separating device for retracting the separated cops into said first cop separating device, each cop being circulated between said first and second cop separating devices until a thread end of a desired length is loosened from the cop and the cop is transported from the cycle to a winding machine.

4,508,228
CARD FRAMES

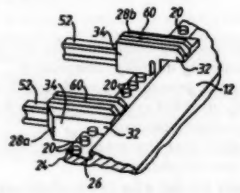
David P. Erlam, Winchester, England, assignor to Rittal-CSM Limited, Hampshire, England

Filed Jun. 25, 1982, Ser. No. 392,165

Claims priority, application United Kingdom, Jun. 29, 1981, 8119939

Int. Cl.[3] **H02B** *1/02*

U.S. Cl. 211—41 **9 Claims**



1. A card frame having a front side, a rear side, a top side and a bottom side, and comprising a front cross rail, a rear cross rail and a card guide engageable with said front and rear cross rails, wherein:

said card guide comprises a pair of end elements each engageable with a respective one of said front or rear cross rails;

each said end element is engageable with its associated cross rail in a first position and in a second position, said first and second positions being mutually spaced in both the top to bottom and front to rear directions of the card frame; and

said card guide further comprises a shank formed separately from said end elements and assembled with the end elements, whereby when the card guide is assembled the end elements will engage with the cross rails in their first positions or in their second positions, in accordance with whether the shank is of a first or second length, each said end element having at least one engagement means at a first location and at least one further, like engagement means at a second location spaced from said first location in both the top-to-bottom and front-to-rear directions of the card frame, and each said cross rail having engagement means complementary with said engagement means of said end elements and which can be engaged with the engagement means of an end element at either said first or second location.

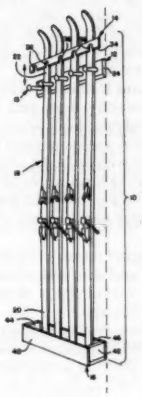
4,508,229
SKI RACK

William G. Yost, Jr., 10440 Six Mile Rd., N.E., Rockford, Mich.

Filed May 12, 1983, Ser. No. 493,987

Int. Cl.[3] **A47F** *7/00*

U.S. Cl. 211—70.5 **15 Claims**



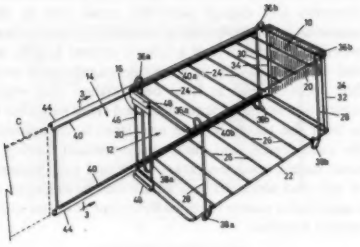
1. A ski-storage device comprising:

a peg board to be secured to a vertical support surface, said peg board including a base and a plurality of generally linearly aligned peg members extending in generally a common direction away from said base, at least two of said peg members each including a shaft portion and an enlarged head portion extending from said shaft portion generally opposite said base, said peg members being horizontally spaced to receive vertically oriented skis therebetween; and

a keeper bar removably supported on said pegs, said keeper bar being completely unattached with respect to said peg board so as to be entirely removable from said peg board to permit ready access to said peg board, said keeper bar defining a plurality of downwardly facing openings to receive said shaft portions when said keeper bar is sup-

ported thereon, said openings having a width wider than said shaft portion and more narrow than said head portion, whereby when said keeper bar is supported on said pegs to secure skis between said keeper bar and said base, said keeper bar cannot pass axially beyond said peg heads.

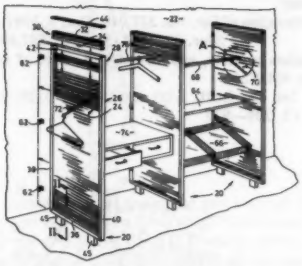
4,508,230
REVERSIBLE ANGLE DISPLAY
Richard D. A. Ashton, Terra Cotta, Canada, assignor to North American Decorative Products Inc., Bramalea, Canada
Filed Jan. 26, 1983, Ser. No. 440,720
Int. Cl.³ A47F 5/14
U.S. Cl. 211—181 **9 Claims**



1. A modular display unit for the combined storage and display of products for sale and comprising:
upper and lower panel means formed of wire rod construction;
side panel means formed of wire rod construction;
rear end panel means, the front of such unit being open, thereby defining a generally rectangular bin open at one end for storing products therein;
upper tongue means formed by wire loops extending upwardly and inwardly from said upper panel means extending on predetermined first axes;
lower tongue means formed by wire loops extending downwardly and inwardly from said lower panel means, extending on predetermined second axes offset from said first axes whereby said upper and lower tongue means are interengageable with adjacent said units for vertical stacking of such units to form stacks of such bins, whereby said lower panel means of one said unit rests generally square against said upper panel means of an adjacent lower said unit;
display panel support means extending forwardly form one of said sides of said unit, and adapted to receive a product display panel therein for a display related to product stored in such bin, and,
product information display support means attached to said unit, and adapted to receive a product information panel related to such product stored in such bin.

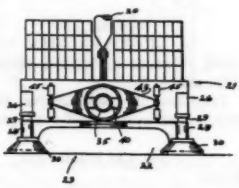
4,508,231
WALL UNIT
Reuben Honickman, 66 Collier St., Suite 4B, Toronto, Ontario, Canada M4W 1L9
Filed Mar. 4, 1981, Ser. No. 240,515
Int. Cl.³ A47F 5/00
U.S. Cl. 211—199 **8 Claims**

1. A wall unit having a frame including a pair of frame members arranged in generally vertical positions at opposite sides of the unit and defining respective channels which face one another; a stack of elongate members extending transversely of the unit between said frame members with opposite end portions of each said elongate member received within the channels of the respective frame members and dimensioned to permit free sliding movement of the elongate member along the frame member channels, each elongate member having parallel upper and lower surfaces and the elongate members being arranged in superposed relationship and resting on top of one another under the effect of gravity with the lower surface of an upper member supported on the upper surface of member below, wherein each said elongate member comprises a solid one-piece extrusion of uniform cross-sectional shape throughout its length having parallel upper and lower surfaces, the extrusion having a cross-sectional shape formed by respective top and bottom webs defining said upper and lower surfaces, a central web extending between the top and bottom webs generally centrally thereof and disposed generally normal to said upper and lower surfaces, respective intermediate webs which



extend outwardly from said central web generally centrally thereof and which having respective upper and lower lips at their outer ends, said lower web including similar upwardly extending lips at its outer ends, whereby the webs define four laterally directed channels two at each side of said member and each of which has a lip extending along its lower edge so that an article supporting element to be fitted to the unit can be engaged in any of the channels defined by the elongate elements of the unit and can be engaged over the lip of the relevant channel and thereby retained in the channel at any of an infinite number of positions spaced therealong.

4,508,232
COUNTERBALANCED CRANE STRUCTURE
Neil F. Lampson, Kennewick, Wash., assignor to Riggers Manufacturing Co., Kennewick, Wash.
Filed Dec. 10, 1981, Ser. No. 329,193
Int. Cl.³ B66C 23/08
U.S. Cl. 212—178 **6 Claims**



1. A counterbalanced crane structure, for operational use in lifting load requiring mobility; comprising:
first and second ground-supported mobile platforms;
an upwardly directed crane boom mounted to one of said first and second platforms;
counterbalance means mounted on the remaining one of said first and second platforms;
a rigid stinger having a longitudinal stinger axis;
means operably connected between one end of the stinger and the first ground-supported mobile platform for con-

joint pivotal movement of the stinger and said first platform about the longitudinal stinger axis;

means operably connected between the remaining end of the stinger and the second ground-supported mobile platform for eliminating undesirable loading or binding between the first and second platforms and the stinger by permitting free relative pivotal movement between the stinger and second platform about the longitudinal stinger axis during operational use of the counterbalanced crane structure;

at least one stinger arm rigidly connected to said remaining end of the stinger and extending therefrom;

and releasable, adjustable locking means mounted on said second platform for adjustably and securely engaging said stinger arm to prevent relative pivotal movement between the stinger and second platform about the longitudinal stinger axis.

4,508,233

COMPACT HEAVY DUTY LIFTING CRANE

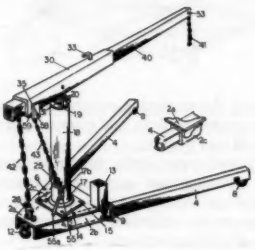
Thomas G. Helms, 19036 Napa St., Northridge, Calif. 91324

PCT No. PCT/US81/00691, § 371 Date Jan. 18, 1983, § 102(e) Date Jan. 18, 1983

PCT Filed May 21, 1981, Ser. No. 479,866

Int. Cl.³ B66C *23/26*; B60P *1/00*; B65G *7/08*

U.S. Cl. 212—182 **11 Claims**



1. A Compact Heavy Duty Lifting Crane (CHDLC) comprising:

(a) a base assembly;

(b) a removable pylon plate attached to said base assembly;

(c) A stationary pylon cylinder means including an upper and a lower cylinder portions attached to said pylon plate, a vertically extending slot located in said upper cylinder portion, said lower cylinder portion including a plate mounted at the top thereof with an opening therein and a second opening located on the side thereof;

(d) a lifting jack mounted within said stationary pylon cylinder a jack control handle extending through said second opening in said stationary pylon cylinder;

(e) a telescoping pylon cylinder revolvingly positioned over said upper cylinder portion of said stationary pylon cylinder means so that it can be raised vertically by said lifting jack and having a locking hole at the lower end thereof and a cover rigidly attached to its top end, said cover having outward clevis members thereon with each member having a concentric hole therein;

(f) a releasable locking means for locking said telescoping pylon cylinder to said stationary pylon cylinder means to prevent radial movement relative thereto with respect to said stationary pylon;

(g) a hollow stationary boom having attached to its lower side a left and a right mounting plate with each plate having concentric holes that correspond to the holes in the mounting plates attached to said telescoping pylon cylinder;

(h) a clevis pin inserted through the set of corresponding holes in said mounting plates and clevis members whereby said stationary boom can be displaced about said pin in a vertical direction;

(i) a telescoping boom slideingly inserted into the hollow opening of said stationary boom whereby said telescoping boom can be displaced relative to said stationary boom;

(j) a locking means for locking said telescoping boom to said stationary boom to prevent movement of said telescoping boom with respect to said stationary boom;

(k) means for attaching a lifting chain and hook assembly to the front end of said telescoping boom;

(l) means for attaching a respective end of a first boom control chain and a second boom control chain to the back end of said stationary boom;

(m) means for selectively attaching an opposite end of said first boom control chain to said telescoping pylon cylinder;

(n) means for selectively attaching an opposite end of said second boom control chain to said base assembly;

(o) a first and a second channel section rigidly attached on opposite sides to the underside of said base assembly;

(p) a first removable leg and a second removable leg each sized to slidable fit into their respective said first and second channel sections;

(q) means for locking said first and said second removable legs into said first and said second channel sections, respectively;

(r) a first wheel and a second wheel rotatably attached to said first and said second removable legs;

(s) a third wheel and fourth wheel rotatably attached to said base assembly, means for retracting said third and fourth wheels when said CHDLC is in use, and extending said wheels when said CHDLC is in the storage mode.

(t) a caster wheel rotatably attached to the underside of said base; and

(u) a first and second leg storage receptacle consisting of a channel section sized to receive said removable legs and where each storage receptacle is mounted vertically to the top side of said base whereby said removable legs can be removed from their functional position and inserted into said storage receptacles for storage.

4,508,234

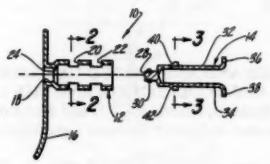
MANUALLY RELEASABLE DRAINPORT CLOSURE APPARATUS

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Filed Aug. 17, 1983, Ser. No. 523,847

Int. Cl.³ B65J *55/02*

U.S. Cl. 215—206 **5 Claims**



1. A drainport closure for a fluid containing vessel comprising:

a housing communicated to said vessel,

a plug slidably received by said housing, said plug having a pair of legs one or more of which when deflected permit said plug to be moved between a first position within said housing preventing fluid drainage from said vessel to a second position within said housing allowing fluid drainage from said vessel, said legs having a portion engagable with said housing and disposable within said housing and a free end portion removed from said engagable portion and having seal means at one end of said plug preventing

flow from said vessel when said plug is in said first position, said seal means allowing fluid drainage from said vessel when said plug is moved to said second position.

4,508,235

BEVERAGE CUP COVER

Edward J. Steele, Mission Viejo, and Rodney N. Sexton, Laguna Hills, both of Calif., assignors to Runglin Co. Inc., Culver City, Calif.

Filed Dec. 7, 1983, Ser. No. 558,805
Int. Cl.³ B65D *51/16*
U.S. Cl. 215—307 **4 Claims**

1. A beverage cup and cover combination in which:

(a) said cup has an upper rim in the form of an integral bead extending radially beyond the top edge of the cup wall to define an annular underledge; and

(b) said cover is of hemispherical shape whose height is substantially one half its base including a top opening of diameter less than one half the diameter of the cup opening; the base of said hemispherical shape flaring radially outwardly to define an annular surface for seating on the top edge of said cup opening, and thence downwardly; to define a skirt dimensioned to overlie said bead; the side wall of said skirt having a series of uniformly circumferentially spaced inward radially directed indentations over 360°; said indentations defining upwardly facing segments for engaging under said annular underledge of said bead upon forcing the cover skirt over said annular bead to deform the indentations until they snap over the bead to said upwardly facing segments are free to engage under said annular underledge upon return of the indentations to their original form so that the cover is secured in plcae on said cup.

4,508,236

CONTAINER AND ASSOCIATED CAP ASSEMBLY FOR PLASMA COLLECTION AND THE LIKE

Michael R. Keilman, Mundelein, Ill., and Richard West, Salem, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 417,728, Sep. 13, 1982,. This application Jul. 31, 1984, Ser. No. 636,075
Int. Cl.³ B65D *51/16*
U.S. Cl. 215—308 **1 Claim**

1. A container assembly in which a parenteral fluid has been collected comprising

a container having an interior in which the parenteral fluid is carried and a port communicating with the interior, and

a cap including

a body engaged with said container port,

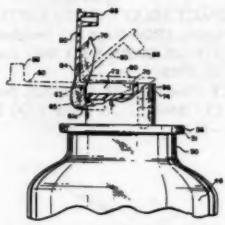
means for defining in said body a normally open vent passage which includes therein filter means for permitting the passage of air and for preventing the passage of bacteria,

means for defining a fluid path through said body having one end communicating with the atmosphere and an oppositely spaced end communicating with said container interior,

wall means for defining in said body the confines of an elongated pocket which extends parallel to said fluid path and which includes an open end disposed adjacent to said one fluid path end,

flexible tubing attached to said one fluid path end, said tubing having had an initial length when the parenteral fluids were introduced into said container interior and now having been sealed and severed in close proximity to said one fluid path end to form a sealed length which is shorter than said intial length,

one portion of said sealed length of tubing extending in tight overlying engagement against said cap body from said one fluid path end through said open end of said pocket to form a crimp in said tubing length at said open



pocket end, the remaining portion of said sealed length of tubing extending from said crimped portion into said confines of said pocket,

said pocket wall means being further operative for frictionally retaining said remaining portion of tubing within said confines of said pocket and for shielding said remaining portion of tubing from contact within said confines of said pocket, and

cover means attached to said cap body for movement between a normally biased first position spaced away from said vent passage to open said vent passage and allow the introduction of parenteral fluid into said container interior and a second position in said vent passage to hermetically close said vent passage and, together with said crimped sealed length of tubing retained in said pocket, hermetically seal the parenteral fluid within said container interior.

4,508,237

COLLAPSIBLE CONTAINER

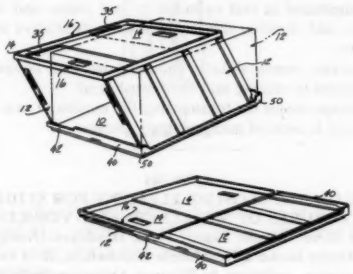
Elsmer W. Kreeger, Allegan, and Edward L. Stahl, Brighton both of Mich., assignors to Pinckney Molded Plastics, Inc., Pinckney, Mich.

Continuation of Ser. No. 366,879, Apr. 9, 1982, abandoned. This application Jan. 16, 1984, Ser. No. 570,762
Int. Cl.³ B65D *6/18, 21/02*
U.S. Cl. 220—6 **3 Claims**

1. In a collapsible container having a flat horizontal rectangular bottom, stacking rail means projecting downwardly from the underside of said bottom in parallel relationship to the ends and sides of said bottom, a rigid rectangular upper peripheral rim dimensioned to receive the stacking rail means of a like container to support said like container upon said rim while retaining said like container against horizontal displacement relative to said rim, a pair of opposed side walls, first hinge means coupling the lower edges of each of said side walls to said bottom along the respective opposite side edges thereof, second hinge means coupling the upper edges of said side walls to the underside of said rim along the respective side edges thereof, a pair of end walls, the length of said end walls exceeding the height of said side walls, third hinge means coupling the

upper edges of said end walls to the underside of said rim along the respective end edges thereof, said hinge means accommodating movement of said bottom, side walls, end walls and rim relative to each other between an erected position wherein said side and end walls extend vertically upwardly from said bottom and a collapsed position wherein said end walls project horizontally inwardly from said end edges of said rim and said side walls are disposed in horizontal positions wherein one of said side walls lies upon said bottom and the other side wall projects horizontally outwardly from its associated side of said bottom;

the improvement comprising stop means on said bottom engageable with said one of said side walls when said one of said side walls is in its erected position to prevent hinging movement of said one of said side walls outwardly



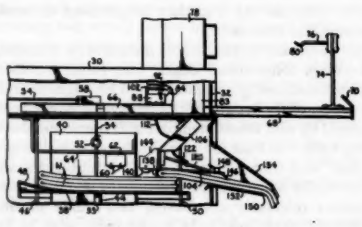
from said bottom, a pair of first vertical web means, each having an elevated section, extending along the respective ends of said bottom from that side of said bottom at which said one of said side walls is located for a distance substantially equal to, but less than, the height of the side wall, and a lower section extending from the end of said elevated section to the opposite side of said bottom, said first web means being respectively located outwardly of the opposite ends of said one of said side walls to receive said one of said side walls therebetween when in its collapsed position and said elevated sections having a height above said lower sections equal to the vertical thickness of said rim whereby the end edges of said rim rest upon said lower sections and define an extension of said elevated sections when said side and end walls are in their collapsed positions.

4,508,238

NEWSPAPER VENDING MACHINE

Nathan D. Johnson, 9808 Knox, Overland Park, Kans. 66212; James D. Sampson, 435 Camden, and Darwin L. Sampson, 1701 Upper Mill Ter., both of Salina, Kans. 67401

Filed Jul. 14, 1982, Ser. No. 398,098
Int. Cl.³ G07F *11/12*
U.S. Cl. 221—107 **14 Claims**



1. A newspaper vending machine comprising:

a housing defining an enclosed interior and having a front portion presenting an outlet slot for dispensing newspapers one at a time;

a tray in said housing adapted to receive a stack of newspapers, said tray being supported within the housing for generally vertical movement;

a normally locked door on said housing providing access to the housing interior when open to permit a stack of newspapers to be deposited on said tray;

a slide arm supported on the housing for fore and aft sliding movement lengthwise of the arm between an extended position and a retracted position, said arm having an accessible front end projecting forwardly of said front portion of the housing and a handle on said front end for pulling the arm forwardly to the extended position;

means for biasing said slide arm toward the retracted position;

a carriage overlying said tray for feeding the newspapers one at a time to said outlet slot;

link means for flexibly suspending said carriage from said slide arm in a manner to move the carriage fore and aft in response to fore and aft movement of said arm, said link means including a link having an upper end pivotally coupled with said slide arm and a lower end coupled with said carriage;

yieldable means for urging said tray upwardly to maintain contact between said carriage and the top newspaper in the stack on said tray; and

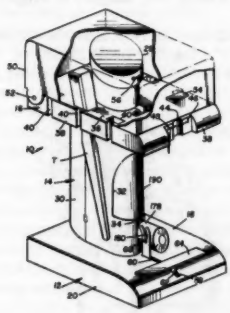
gripping means on said carriage for gripping the upper surface of the top newspaper in the stack in a manner to separate the top newspaper and feed the same to said slot in response to forward movement of the carriage effected by pulling of said slide arm from the retracted position to the extended position, whereby the top newspaper in the stack is delivered to said slot each time said slide arm is pulled to the extended position.

4,508,239

TOOTHPASTE DISPENSER

David L. Rozzen, 750 Lincoln Rd., No. 67, Yuba City, Calif. 95991

Filed Mar. 1, 1983, Ser. No. 471,052
Int. Cl.³ B67D *5/32*; B65D *35/28*
U.S. Cl. 222—39 **24 Claims**



1. Apparatus for dispensing toothpaste from an elongated container of toothpaste which includes a tubular neck at one end, said neck having a mouth, said apparatus comprising:

a stiff pressurization tube which is relatively slender compared to said neck and mouth;

an inflater head mounted on one end of said pressurization tube and having at least one outlet opening through which pressurized fluid injected into said pressurization tube may issue;

a balloon sleeved over said inflater head and having a balloon neck circumferentially sealed relative to the external

periphery of said pressurization tube, so that as pressurized fluid issues from said at least one outlet opening of said inflater head, such pressurized fluid will pressurize and tend to inflate said balloon;

a dispenser cap for said container neck including cooperative securement means for securing said dispenser cap on said container neck;

said dispenser cap including an openable/closeable valve which, only when in an open condition, allows toothpaste to flow out through said mouth of said container neck, under motivation provided by superatmospheric pressure within said balloon due to pressurization of said balloon by injection of pressurized fluid thereinto via said pressurization tube and inflater when said balloon is disposed within said container on said inflater head;

said pressurization tube having an inlet end;

said dispenser cap including an opening having an annular gasket sealingly fitted therein; said pressurization tube near said inlet end thereof being circumferentially sealingly received in said annular gasket so that said pressurization tube may be supplied with pressurized fluid through said inlet end from externally of the toothpaste container while said dispenser cap remains in place on said neck;

the dispenser cap including an internally threaded skirt as said cooperative securement means; a tubular coaxial extension of said skirt, and an axially outer end wall; a tubular side outlet communicating laterally through the tubular coaxial extension with the interior of the cap; said openable/closeable valve being provided on said tubular side outlet distally of said tubular coaxial extension;

said opening of said dispenser cap in which said annular gasket is fitted being provided in said axially outer end wall of said dispenser cap;

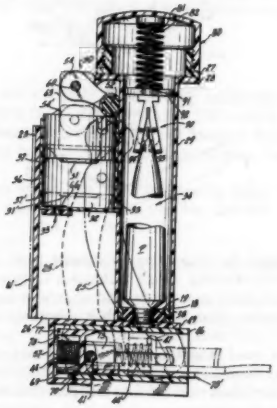
said annular gasket further including an annular boss located externally of said outer end wall of said dispenser cap for facilitating connection of a source of pressurizing fluid to said inlet end of said pressurization tube from externally of said dispenser cap, said pressurization tube, from externally of said dispenser cap being constructed and arranged for connection with a source of pressurizing fluid.

4,508,240

DEVICE FOR EXTRACTING PASTE FROM A TUBE

Aurelio Arango, Miami, Fla., assignor to Miguel Angel Arango, Miami, Fla.

Filed Jan. 20, 1983, Ser. No. 459,390
Int. Cl.³ B65D *35/54*
U.S. Cl. 222—96 **3 Claims**



1. A dispenser of toothpaste from a tube manually operated by a user by inserting a toothbrush comprising, in operative combination:

A. a housing;

B. an air-tight chamber mounted within said housing and adapted to receive said tube and further comprising a removable cap having a puncture assembly adapted to puncture said toothpaste tube so that the increased air pressure built up within said chamber facilitates the extraction of the paste from said tube;

C. pneumatic means for compressing air mounted within said housing and connected to said chamber, including a cylinder, a piston snuggly fitted within said cylinder, a one-way valve mounted on the bottom of said cylinder and an opening connected to said chamber so that air from the atmosphere may be admitted through said valve and compressed in said cylinder by said piston and injected into said chamber thereby increasing its relative air pressure;

D. carrier means slidably mounted on said housing and adapted to receive said toothbrush; and

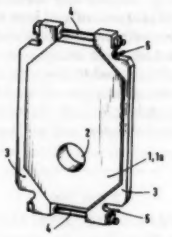
E. linkage means for transmitting the motion of said carrier means to actuate said pneumatic means.

4,508,241

SLIDABLE CLOSURE ELEMENT FOR SLIDE CLOSURES OF METALLURGICAL VESSELS

Gerhard Bauer, Moers; Eckart Hees, Dinslaken-Hiesfeld, and Karl-Dieter Beckers, Neunkirchen-Seelscheid, all of Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft vorm. August Thyssen-Hutte, Duisburg and Martin & Pagenstecher GmbH, Cologne, both of, Fed. Rep. of Germany

Continuation of Ser. No. 263,714, May 14, 1981, abandoned. This application Aug. 26, 1983, Ser. No. 526,915
Claims priority, application Fed. Rep. of Germany, May 17, 1980, 8013402
Int. Cl.³ B22D *41/08*
U.S. Cl. 222—600 **26 Claims**



1. A slidable closure element for slide closures of metallurgical vessels having pouring openings, comprising:

a refractory plate having two transversely longitudinal spaced edges and connecting transverse edges, said refractory plate having a greater longitudinal dimension than transverse dimension;

a pair of equally formed frame members for clamping therebetween longitudinal edges, said frame members being positioned and lying against opposite edges of said plate, a portion of the length of the transverse edges being unengaged by said frame members said frame members engaging tightly at least the opposed longitudinal edges of said plate, said frame members being positioned axially symmetrically when clamped relative to said plate; tensioning screws releasably connecting said frame members and drawing them into tight engagement with at least said longitudinal edges, said tensioning screws extending over said portion of said length of said transverse edges which are unengaged by said frame members.

4,508,242
TOOTHPASTE EXTRACTOR

Edward B. Wolfe, 500 Fairview Ave., Hyde Villa, Reading, Pa. 19605

Filed Oct. 21, 1982, Ser. No. 435,570
Int. Cl.[3] B65D *35/28*
U.S. Cl. 222—102 2 Claims

1. An apparatus for dispensing toothpaste or like contents from one of a multiplicity of collapsible tubes onto a toothbrush or other object which comprises:

a housing;

reversible motor means located within said housing for selectively rotating a threaded output shaft means in a clockwise or counterclockwise manner;

means for powering said motor means located within said housing;

threaded output shaft means directly associated with said motor means for moving a rotatable roller means linearly in a first direction and a second direction on said threaded output shaft means, as said shaft means moves in a clockwise and counterclockwise manner;

rotatable roller means associated with said shaft means so as to move on said shaft means as said shaft means rotates;

outlet means associated with said housing through which said paste from said collapsible tube is expelled;

closure member movable across said outlet means and reciprocally movable across said outlet means between a first position where said outlet is closed to a second position where said outlet is open;

first switch means associated with said motor means for actuating said motor means by said power means so as to rotate said shaft means;

a toothbrush for moving said closure member from said first position to said second position wherein said closure member directly engages said first switch means so as to actuate said motor means such that said roller means moves on said shaft means and said toothpaste is applied to said toothbrush;

second switch means associated with said motor means for actuating said motor means by said power means so as to selectively rotate said shaft means in a clockwise and counterclockwise manner upon actuation of said motor means such that said roller means moves in a first direction and a second direction on said shaft means;

third switch means associated with said power means and actuated by said roller means for reversing the polarity of said motor means when said roller means has moved in said first direction so as to completely dispense the contents of said collapsible tube;

fourth switch means associated with said power means and actuated by said roller means for reversing the polarity of said motor means when said roller means has moved in said second direction so as to be at the extremity of its starting position;

a multiplicity of tube holding means located within said housing;

a selector means to rotate said roller means to the appropriate position to operate on a particular tube holding means;

an indicator means to inform the operator when said roller means has been moved by said selector means to said appropriate position to operate on a particular tube holding means;

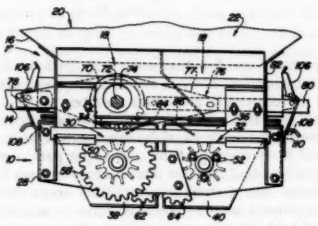
a connector means to provide linkage between said selector means and said roller means only when said roller means is at the extremity of its starting position;

a bearings means which allows said roller means to be rotated without turning said shaft means.

4,508,243
SEED METER ASSEMBLY

Timothy A. Deutsch, Newton, and Howard C. Hadley, Urbandale, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 3, 1983, Ser. No. 463,175
Int. Cl.[3] B67D *5/52*
U.S. Cl. 222—142 21 Claims



1. In an agricultural implement having a frame and a material hopper opening into a discharge area, a meter assembly comprising:

a housing having first and second ends and defining material input and output sections;

metering structure journalled for rotation in the housing between the input and output sections;

means hingedly connecting the first end of the housing to the frame for permitting the housing to swing between an operating position wherein the input section of the housing is closely adjacent the hopper discharge area, and a service position wherein the input section is removed from the discharge area, said means hingedly connecting including horizontal pivot means offset from the hopper discharge area for supporting the housing in a horizontal attitude in the operating position and a vertical attitude in the service position, wherein in the service position the housing is suppported from the frame at a location offset with respect to the hopper discharge area and opens generally outwardly for substantially unencumbered access to the metering structure;

means for releasably securing the housing in the operating position; and

drive means operable when the housing is in the operating position to rotate the metering structure for metering material from the discharge area to the output section, said drive means comprising a driven gear journalled for rotation in, and swingable with, the housing, and a drive gear journalled for rotation on the frame between the horizontal pivot means and the hopper discharge area, said gears so located that when the housing is in the operating position, the drive and driven gears are in driving relationship with each other, and as the housing is swung away from the operating position the driven gear moves to a non-driving relationship with respect to the drive gear.

4,508,244

PRESSURE CAN FOR APPLICATION OF MOUNTING FOAMS, IN PARTICULAR, SINGLE-COMPONENT POLYURETHANE FOAMS

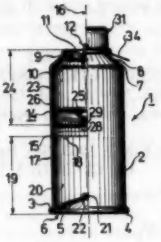
Emil Plaschka, Marbella, Spain; Mathias Pauls, Haltern, Fed. Rep. of Germany, and Guido Niggli, Balgach, Switzerland, assignors to Polypag A.G., Switzerland

Filed Nov. 5, 1982, Ser. No. 439,418

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144094; Nov. 27, 1981, 3147004; Nov. 27, 1981, 3147006

Int. Cl.[3] B65D *83/14*

U.S. Cl. 222—153 14 Claims



1. A pressure can for dispensing polyurethane foams, comprising: a cylindrical body, a dome-like upper part having an opening therethrough; a closure member sealingly disposed across said opening; a valve body inset in said closure member for dispensing the contents of the can; a can bottom closing the end of said body opposite from said upper part; a piston slideably disposed in said cylinder intermediate its ends for dividing said cylinder into a foam-former filling space between said piston and closure member and a propellant space between said piston and said can bottom; said piston having a circumferential skirt depending therefrom toward said can bottom, and means for permitting a small amount of propellant to pass from said propellant space to said foam-former filling space while substantially preventing said foam-former from passing from said foam-former space to said propellant space, whereby said foam-former filling will have a small fraction of propellant dissolved therein while under pressure in the can, which fraction will flash from solution when said filling is dispensed from said can at atmospheric pressure, creating bubbles in said dispensed foam-former filling for enhancing its foaming.

4,508,245

DISPENSERS FOR FLOWABLE COMPOSITIONS

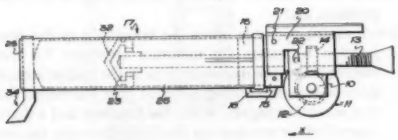
Kenneth Houlbrook, Huddersfield, and Paul A. Thornton, Barnsley, both of England, assignors to Clantex Limited, W. Yorks, England

Continuation of Ser. No. 350,830, Feb. 22, 1982, abandoned. This application Jan. 26, 1984, Ser. No. 574,046

Claims priority, application United Kingdom, Feb. 24, 1981, 8105793

Int. Cl.[3] B65D *88/54*

U.S. Cl. 222—327 9 Claims



8. A cartridge for flowable composition comprising:

(a) an elongate body portion having a cylindrical interior bore for receiving a slideable piston;

(b) a nozzle end portion which closes one end of the body portion and has a passage which lies transverse to the said interior bore and intersects said bore, said passage being for receiving in friction fitting fashion a nozzle tube so that an end of such tube will project laterally from the cartridge;

(c) the said body portion being sufficiently open at the other end of the cartridge to receive a pusher whereby a piston in the bore can be displaced along the bore to expel composition in said bore out of a nozzle tube in the passage;

(d) the said bore intersecting the passage at a single zone of intersection, which in the direction transverse to the axis of the bore is of less dimension than the width of the bore,

(e) said bore having a portion of non-circular section for engagement with a portion of a nozzle tube of similar section to facilitate positioning of the nozzle tube when inserted in said bore.

4,508,246

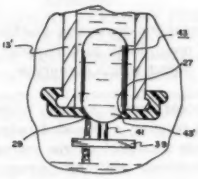
CHECK MEANS FOR A WATER DISPENSER

James F. Grenn, Rte. 2, Box 169, Bogue Chitto, Miss. 39629

Filed Sep. 19, 1983, Ser. No. 533,767

Int. Cl.[3] B65D *47/00*

U.S. Cl. 222—477 9 Claims



1. A check means in combination with an invertible water bottle and a water dispenser for checking any spillage of water from the mouth of the water bottle when the water bottle is inverted for placement on the water dispenser, said check means comprising:

(a) a cap member for secure attachment over the mouth of the water bottle, said cap member having an aperture therethrough for allowing the water to freely pass from the water bottle when the water bottle is inverted; and

(b) float means for momentarily closing said aperture in said cap means when the water bottle is first inverted and for subsequently floating away from said aperture to allow the water to freely flow through said aperture.

4,508,247

STOPPER SUPPORT MECHANISM FOR CASTING CONTAINERS

Stephen D. Mills, 36 Grassington Rd., Beechwood Estate, and Charles D. Brown, 24 Easson St., Grove Hill, both of Middlesbrough, Cleveland, England

Filed Jan. 17, 1983, Ser. No. 458,647

Claims priority, application United Kingdom, Jan. 18, 1982, 8201305

Int. Cl.[3] B22D *41/10*

U.S. Cl. 222—598 5 Claims

1. A stopper and support mechanism for a casting machine of the type including:

a container having an outlet nozzle in its base;

a substantially upright support shaft located externally of the container and guided for axial movement;

a transverse connecting arm extending laterally from an upper end of said support shaft; and,

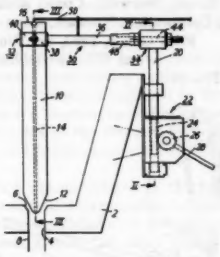
an elongate stopper carried by said transverse connecting arm and supported within said container in substantially upright position in axial alignment with said nozzle:

the improvement comprising:

said stopper being of one piece and being comprised exclu-

sively of a hollow rod of a refractory material having a gas transfer passage extending therethrough between its respective ends;

clamp means rigidly supported by said transverse arm and clampingly engaged with the external periphery of said



stopper adjacent an upper end of said stopper, said clamp means providing the sole support for said stopper; and,

adjustment means interposed between said transverse arm and said support shaft permitting orientation of the longitudinal axis of said elongate stopper relative to the longitudinal axis of said outlet nozzle.

4,508,248

WHEELED APPLICATOR FOR LIQUIDS

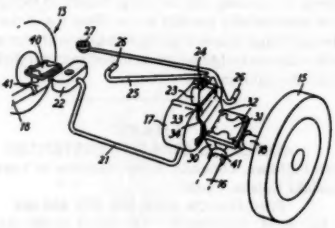
Paul W. Ridgeon, Haslingfield, England, assignor to Walkover Limited, Cambridgeshire, England

Filed Jul. 29, 1982, Ser. No. 402,894

Claims priority, application United Kingdom, Aug. 1, 1981, 8123634

Int. Cl.[3] **A01C** *23/04;* **B05B** *3/18*

U.S. Cl. 222—623 **8 Claims**



1. An applicator comprising a chassis, wheel members supporting the chassis and on which it can be moved over the ground, the wheel members having axes of rotation, a container for liquid or other material arranged to be supported on the chassis, a rotary displacement pump having a rotor mounted on a pump drive shaft for rotation in a pump housing, having an inlet and an outlet for material to be pumped, connection means arranged to connect the pump inlet to the container, the pump drive shaft being common with the shaft on which one of said wheel members is mounted so that as the wheel member rotates the pump supplies material from the container under pressure through its outlet, and including a bearing for the drive shaft located in a bearing housing, means securing the bearing housing to the chassis, and mounting means mounting the pump housing to the bearing housing such that the pump is only secured to the chassis through the bearing housing, so that loads transmitted between the wheel members and the chassis are not transmitted through the pump.

4,508,249

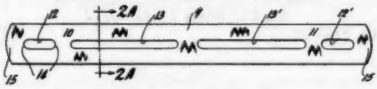
FLASHLIGHT HOLDER

Alan W. Kotchy, 628 Garrison Ave., Nekoosa, Wis. 54457

Filed Sep. 30, 1982, Ser. No. 429,015

Int. Cl.[3] **A45F** *5/00*

U.S. Cl. 224—219 **11 Claims**



1. A flashlight holder including first and second straps, each of said straps comprising a single piece strap of a resilient material having a thickness substantially less than the width of the strap, said strap having first and second openings located respectively in opposite longitudinal halves of said strap, a first of said openings defining an opening adapted to stretch over flashlight whereby said straps are connected to opposite end portions of the flashlight, said second of said openings being larger than said first openings and being adapted to stretch over a forearm, each of said straps including spaced enlargements connected by a connection portion, and said first openings have a length of approximately one inch, and said second openings have a length of approximately three inches.

4,508,250

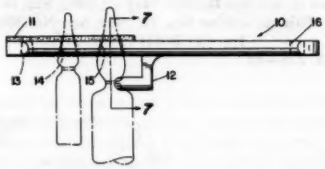
AMPOULE BREAKER TOOL

Kathleen Punchak, 13512 Mohawk Trail, Middleburg Hts., Ohio 44130

Filed Apr. 11, 1983, Ser. No. 483,763

Int. Cl.[3] **G26F** *3/00*

U.S. Cl. 225—97 **9 Claims**



1. An ampoule breaking tool for opening an ampoule having a lower body, an upper bulb portion with an uppermost sealed tip, and a restricted narrowed neck portion interposed between the lower body and the upper bulb, the tool comprising:

an elongated rigid lever having a leverage end and a remote gripping end, the leverage end including at least one through-hole having a frustrum shaped inner wall adapted to engage the mid-section of the bulb portion of the ampoule above the narrowed neck, at least one of the through-holes being a large through-hole to accomodate a large ampoule, and said tool having secured thereto a depending member having a laterally directed pressing arm adapted to engage the neck portion of the large ampoule secured within the large through-hole, whereby manual leverage force applied to the mid-section of the ampoule bulb severs the bulb from the ampoule, the leverage end of the tool contains a plurality of variable size through-holes adapted to engage variable size ampoules.

4,508,251

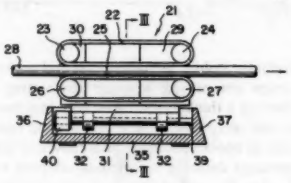
CABLE PULLING/FEEDING APPARATUS

Kazuhiro Harada, Mito; Yuzoh Tsuchiya, Yokohama; Nobuo Sekiguchi, and Toshio Ishikawa, both of Sagamihara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corp., Tokyo and Showa Electric Wire & Cable Co., Kanagawa, both of, Japan

Filed Oct. 26, 1982, Ser. No. 436,856

Int. Cl.³ B65H *17/42, 25/22*

U.S. Cl. 226—25 **4 Claims**



1. A cable pulling/feeding apparatus comprising:

a stationary base;

a carriage mounted through bearings on at least one stationary guide shaft mounted on said base for reciprocating movement and a pair of endless belts for frictionally engaging a straight run of the cable therebetween and cooperating to pull or feed the cable linearly therethrough, said endless belts being rotatably mounted on said carriage allowing reciprocating linear movement of said endless belts relative to said base, in the direction of the travel of the cable; and

a load cell slidably mounted on said guide shaft between said carriage and said base, for producing an electric signal which varies in accordance with pressure applied on said load cell.

4,508,252

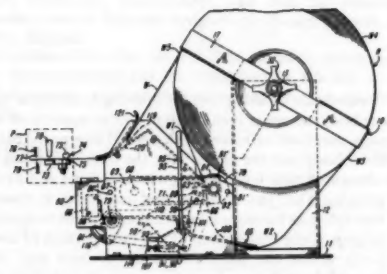
WEB FEEDING METHOD AND APPARATUS FOR A PRINTER

Raymond L. Kirby, Jr., Vandalia, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 152,057, May 20, 1980, Pat. No. 4,331,302. This application Sep. 21, 1981, Ser. No. 304,214

Int. Cl.³ B65H *25/32, 17/20*

U.S. Cl. 226—44 **4 Claims**



1. Web feeding apparatus, comprising: a pair of cooperable rolls for feeding a web, means including an electric motor for driving one of the rolls, means including a manually actuatable member for separating the rolls, means for sensing a taut condition in the web, and means responsive to either a taut condition in the web or actuation of the manually actuatable member for operating the driving means, wherein the operating means includes a movable member connected to both the sensing means and to the manually actuatable member for alternately actuating and deactuating the electric motor.

4,508,253

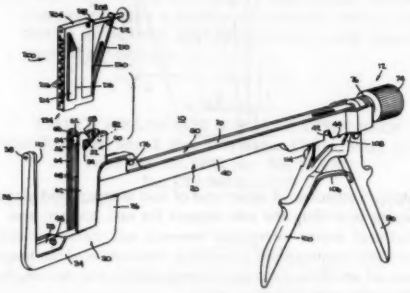
SURGICAL FASTENER APPLYING APPARATUS

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 4, 1983, Ser. No. 538,931

Int. Cl.³ A61B *17/04*

U.S. Cl. 227—19 **19 Claims**



1. Surgical fastener applying apparatus comprising:

a frame having a U-shaped distal portion;

anvil means mounted on the distal leg of the U;

cartridge holder means disposed in the U for linear reciprocal motion toward and away from the anvil means;

cartridge means removably insertable in the cartridge holder means along an axis transverse to the distal leg of the U;

first means associated with the cartridge means and the cartridge holder means for urging the cartridge means into parallel alignment with the anvil means when the cartridge holder means is reciprocated toward the anvil means; and

second means associated with the cartridge means and the frame for causing the cartridge means to move in a direction substantially parallel to the distal leg of the U to bring the cartridge means into registration with the anvil means when the cartridge means is urged into parallel alignment with the anvil means.

4,508,254

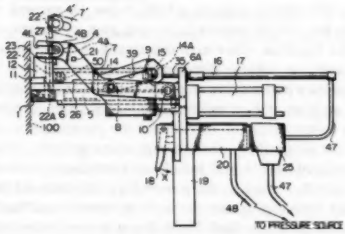
ADHERING GUN FOR FASTENERS

Kousyun Fujiwara, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 29, 1982, Ser. No. 454,088

Int. Cl.³ B25C *5/02;* **B27F** *7/00;* **B32B** *31/00;* **B44C** *7/00*

U.S. Cl. 227—116 **10 Claims**



1. A fastener gun for successive adhesion of adhesive-backed fasteners, comprising

a body having a handle,

a slide adapted for slide movement fitting slidably in the body,

an actuator for effecting the slide movement of the slide, said actuator having an operating trigger,

a fastener loading station having link arms rotatably pivoted to said body,

a fastener preadhering station mounted below the fastener loading station and in front of the slide for positioning fasteners such that the actuator pushes said slide against said fasteners,

means for feeding fasteners loaded in the fastener loading station into the fastener preadhering station one by one,

a fastener exiting station mounted adjacent to the fastener preadhering station at a location such that when said slide pushes fasteners located at the fastener preadhering station from the gun, said fasteners leave through the fastener exiting station,

means for transmitting the movement of said slide to the fastener feeding means, said transmitting means including cam plates connected to said slide so as to move therewith, said fastener loading station link arms being pivotably moved along said cam plates, and

a separator connected to said link arms to move with the pivotable movement of the link arms, said separator separating the fasteners from one another and for carrying the separated fasteners to the fastener preadhering station when said slide is moved to a position opposite to the fastener exiting station.

4,508,255

APPARATUS FOR MANUFACTURING WHEEL RIM BLANKS

Horst Lorenz, Solingen, and Richard Schulte, Wuppertal, both of Fed. Rep. of Germany, assignors to Th. Kieserling & Albrecht, Solingen, Fed. Rep. of Germany

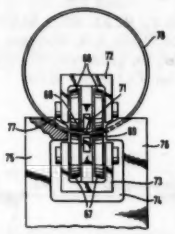
PCT No. PCT/DE81/00166, § 371 Date Jan. 25, 1982, § 102(e) Date Jan. 25, 1982, PCT Pub. No. WO82/01142, PCT Pub. Date Apr. 15, 1982

PCT Filed Oct. 3, 1981, Ser. No. 342,327

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037614

Int. Cl.³ B23K *5/22*

U.S. Cl. 228—5.1 **12 Claims**



1. Apparatus for manufacturing cylindrical rings from flat strips of metal with each ring having a longitudinal axis and opposed ends welded together at a joint, said apparatus comprising: a plurality of work stations including a strip feed station, a ring forming station, a joint orientation station, a welding station for welding said joint and finishing stations for finishing said joint, said ring forming, joint orientation and welding stations being arranged in direct succession for processing a ring moving generally along said ring longitudinal axis through a first transfer path, said strip feed station being positioned for feeding strip to said ring forming station in a direction transverse to said ring longitudinal axis and said first transfer path, and said finishing stations being positioned for receiving rings moving thereto from said welding station in a second transfer path which is oriented transversely of said longitudinal axis of said ring and said first transfer path, said finishing stations having finishing tools working on said ring along a path transverse to said second transfer path and parallel to said axis each said ring has a predetermined width parallel to said longitudinal axis thereof, at least said finishing stations having finishing tools each movable parallel to said axis to finish the joint and stationary U-shaped support means comprising a pair of upwardly open generally U-shaped ring supports of a width approximately the same as said ring predetermined width, said pair of ring supports being respectively on opposite sides of the finishing tool and, said U-shaped ring member supports having web portions spaced apart to engage spaced apart peripheral portions of and center the cylindrical ring member and each said U-shaped ring member having upstanding rigid stationary legs to respectively engage opposite axial ends of the ring member to resist tool forces parallel to said axis.

4,508,256

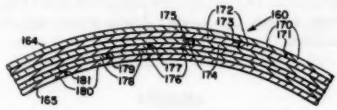
METHOD OF CONSTRUCTING A THREE DIMENSIONAL TUBULAR MEMBER

Clifford J. Radel, Cheviot, and Hugh A. Thompson, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 370,443, Apr. 21, 1982, abandoned, which is a division of Ser. No. 206,410, Nov. 13, 1980, Pat. No. 4,342,314, which is a continuation-in-part of Ser. No. 17,506, Mar. 5, 1979, abandoned. This application Dec. 20, 1983, Ser. No. 563,337

Int. Cl.³ B23K *1/16*; B29C *17/04*

U.S. Cl. 228—152 **7 Claims**



1. A method for constructing a three-dimensional tubular member for continuously imparting a three-dimensional appearance and tactile impression to a plastic web brought in contact with its peripheral surface, said method comprising:

(a) forming patterns of apertures in a multiplicity of planar sheets;

(b) superposing said sheets containing said aperture patterns on one another to form a stack exhibiting a three-dimensional continuum of capillary networks from the uppermost surface to the lowermost surface thereof;

(c) bonding said superposed stack of sheets to one another at contact points to form an integral laminate structure without destroying said continuum of capillary networks;

(d) causing the uppermost surface of said laminate structure to assume a radius of curvature greater than that of said lowermost surface of said laminate structure without causing delamination thereof, thereby causing said laminate structure to assume a substantially tubular shape; and

(e) securing the opposing free edges of said tubular shaped laminate structure to one another while maintaining substantial continuity of said three-dimensional continuum of capillary networks about the entire periphery of the tubular member thus formed.

4,508,257

METHOD OF BRAZING WITH NICKEL BASED ALLOY

Debasis Bose, Randolph; Amitava Datta, Morris Township, Morris County, and Nicholas J. DeCristofaro, Chatham, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 470,403, Feb. 28, 1983, Pat. No. 4,448,618.
This application Mar. 7, 1984, Ser. No. 587,324
Int. Cl.[3] B23K *35/30, 35/14*
U.S. Cl. 228—263.13 7 Claims

Photomicrograph of AISI 316 stainless steel joint brazed with Sample No. 1 alloy of the present invention (Magnification 400 X).

1. A process for fabricating homogeneous ductile foil having a composition consisting essentially of 25 to 35 atom percent palladium and 15 to 20 atom percent silicon, the balance being nickel and incidental impurities, which process comprises forming a melt of the composition and quenching the melt on a moving chill surface at a rate of at least about $10^{5°}$ C./sec.

4. A process for joining together two or more metal parts which comprises:

(a) interposing a filler metal between the metal parts to form an assembly, the filler metal having a melting point less than that of any of the parts;

(b) heating the assembly to at least the melting temperature of the filler metal; and

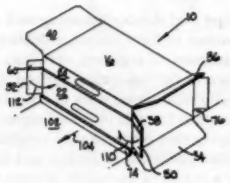
(c) cooling the assembly; wherein the improvement comprises employing, as the filler metal, a homogeneous nickel based foil having a composition consisting essentially of 25 to 35 atom percent palladium and 15 to 20 atom percent silicon, the balance being nickel and incidental impurities.

4,508,258

SLEEVE-STYLE BEVERAGE CARTON

Earl J. Graser, Monroe, La., assignor to Manville Service Corporation, Denver, Colo.

Filed May 10, 1982, Ser. No. 376,855
Int. Cl.[3] B65D *5/46*
U.S. Cl. 229—38 2 Claims



1. A paperboard sleeve-style beverage carton for use on a carton filling machine having traveling flight bars, comprising:

(a) a bottom panel;

(b) a pair of side panels, hingedly connected to opposite sides of the bottom panel;

(c) a first top panel and a second top panel hingedly connected to opposite sides of the side panels, the top panels being overlapped and adhesively secured together, and the top panels having handle means for lifting the carton;

(d) a pair of end panels hingedly connected to opposite ends of each of the side panels, each end panel having an upper and a lower cutout whereby the heights of the end panels are less than the heights of the side panels and the upper and lower edges of each end panel are spaced from the top and bottom panels respectively;

(e) a pair of bottom panel dust flaps hingedly connected to opposite ends of the bottom panel, each bottom panel dust flap having a first bottom panel dust flap cutout on one side and a second bottom panel dust flap cutout on the other side with the first bottom panel dust flap cutouts being larger than the second bottom panel dust flap cutouts whereby the widths of the bottom panel dust flaps are less than the width of the bottom panel, the side edges of the bottom panel dust flaps are spaced from the side panels and the dust flaps can be revolved to extend outwardly from the bottom panel during the filling operation;

(f) a pair of first top panel dust flaps hingedly connected to opposite ends of the first top panel, each first top panel dust flap having a cutout on a side adjacent the side panel, the cutouts being substantially the same size as the first bottom panel dust flap cutouts whereby the widths of the first top panel dust flaps are less than the width of the first top panel, the side edges of the first top panel dust flaps are spaced from the side panels and the first top panel dust flaps can be revolved to extend outwardly from the first top panel during the filling operation;

(g) a pair of second top panel dust flaps hingedly connected to opposite ends of the second top panel, each second top panel dust flap having a cutout on a side adjacent the side panel, the cutouts being substantially the same size as the second bottom panel dust flap cutouts whereby the widths of the second top panel dust flaps are less than the width of the second top panel and the side edges of the second top panel dust flaps are spaced from the side panels; and

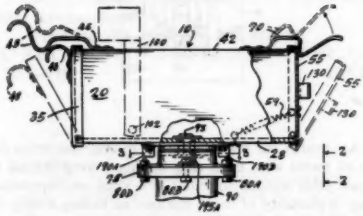
(h) relief means on the hinged connections between at least one of the first and second top panel dust flaps and the respective top panel to aid in the folding of the first and second top panel dust flaps.

4,508,259

VARIABLE ACCESS PARCEL AND MAIL RECEPTACLE

Robert R. Hicks, 1384 Shoop Ave, Wauseon, Ohio 43567

Filed Mar. 14, 1983, Ser. No. 474,880
Int. Cl.[3] B65D *91/00*
U.S. Cl. 232—17 2 Claims



1. A box member apparatus with a hollow interior, and with a bottom undersurface, having a top and bottom portion, for receiving and holding temporarily mailing materials for eventual withdrawal of such materials from said box member, comprising:

(a) a hollow housing member having a bottom undersurface and having interior walls and a frontal end and a posterior end, said box having a frontal entranceway on the frontal end of said housing, with a pivotable doorway adapted to close or open access to the said frontal entranceway;

(b) pivotable secondary entranceway and doorway means

appended to the posterior end of said housing member, said secondary doorway means having means to bias the secondary doorway means from being opened from within the interior of the housing member, and wherein said secondary doorway means has an inner wall and wherein said retaining means comprises a spring member connected between a portion of the interior wall of said housing member and a portion of the inner wall of said secondary doorway means;

(c) vertical support means connected to the bottom undersurface of said bc:: member apparatus and adapted to hold said housing member in a position above the ground, said vertical support means having a vertical central axis;

(d) first movement means integrally connected on the bottom undersurface of said housing member for allowing movement of said housing member around the vertical central axis of said vertical support means from a first horizontal position to a horizontal position an arcuate distance of one hundred and eighty degrees around said vertical axis to a second horizontal position;

(e) second movement means interconnected to said first movement means on the bottom undersurface of said housing member to permit tilting movement of said housing member about a horizontal axis which is perpendicular to the vertical central axis of said vertical support means.

4,508,260

PORTABLE CONTAINER FOR VALUABLE ARTICLES

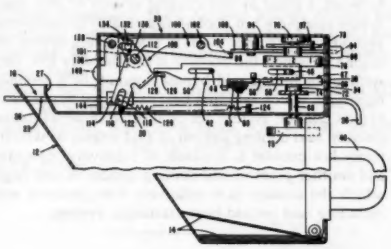
Grant G. H. Keir; John A. Peebles; Jonas K. McNab, and Ian N. Campbell, all of Dundee, Scotland, assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 30, 1983, Ser. No. 509,488

Claims priority, application United Kingdom, Feb. 3, 1983, 8302932

Int. Cl.³ G08B *13/08*; E05B *39/04*

U.S. Cl. 232—43.1 **15 Claims**



1. A container for articles, comprising:

locking means arranged to permit the deposit of said articles in said container when in an unlocked condition and to prevent deposit of said articles in said container when in a locked condition; and

resettable indicator means for indicating the number of times said locking means has been unlocked after a resetting of said indicator means;

said resettable indicator means comprising an indicator member arranged to be sequentially moved from one to another of a predetermined number of possible positions each time an unlocking and locking cycle of operation of said locking means takes place; and said container further comprising a container opening means, separate from said locking means, for gaining access to the interior of the container for the purpose of removing said articles held in the container and for resetting said indicator member to an initial position.

4,508,261

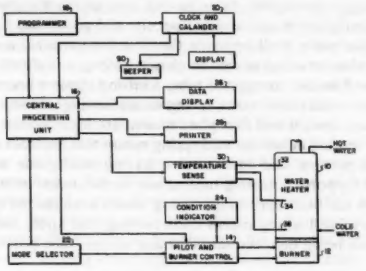
HOT WATER CONTROL AND MANAGEMENT SYSTEM

Gerald Blank, 702 Forward St., La Jolla, Calif. 92037

Filed Jan. 28, 1982, Ser. No. 343,532

Int. Cl.³ F23N *1/08*; F24H *1/00*

U.S. Cl. 236—20 R **19 Claims**



1. A hot water control system, said system comprising:

a water reservoir for containing a predetermined quantity of water,

a heat source for heating the water in said reservoir to a predetermined temperature, and

control means including programmable means for selectively programming said heat source for heating, at a preselected rate, water contained in said reservoir to a preselected temperature at at least one preselected time to meet demand for a given quantity of heated water during a predetermined peak period of time subsequent to said preselected times and preselected times occurring over a given time interval, and

means for sensing the temperature of water in said reservoir, and means for determining, from said temperatures, and the temperature of an available cold water supply, and the capacity of said reservoir, the currently available supply of hot water and, means for visually indicating the currently available supply of hot water of a selected temperature equal to or less than the temperature of said water in said reservoir.

4,508,262

THERMOSTAT ATTACHMENT FOR A VALVE

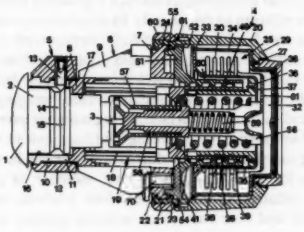
Svend P. Pedersen; Jens J. Molbaek, and Allan H. Hansen, all of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Sep. 12, 1983, Ser. No. 531,412

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1982, 3236372

Int. Cl.³ F24F *11/06*

U.S. Cl. 236—42 **12 Claims**



1. A thermostatic valve assembly, comprising a base member, a cup shaped knob mounted in rotatable relation and axial

fixed relation to said base, said knob having an end wall, an expansible working element having a rigid outer shell with first plate means at one end thereof which frictionally engages said knob end wall, and an axially flexible inner shell with second plate means at one end thereof in adjustable spaced relation to said first plate means, said inner and outer shells forming an interior space for a liquid-vapor filling and said inner shell being a corrugated tube having one end connected to the second plate means and an opposite end connected to the end of the outer shell opposite the first plate means, a coupling member attached to said knob and having a first tube portion nested in said corrugated tube, a setting element connected to said second plate means, spring means biasing said second plate means toward said first plate means, axially movably supporting bearing means for said spring means that includes a second tube portion, said base member having axial guide means for said supporting bearing means, and thread means between said knob and said supporting bearing means to adjust the compression of said spring means upon turning said knob, said thread means being between said first and second tube portions.

4,508,263

THERMOSTATIC VALVE

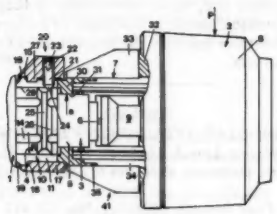
Svend P. Pedersen, Nordborg; Soren N. Wrang, Sonderborg, and Jens J. Molbaek, Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Sep. 12, 1983, Ser. No. 531,510

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3236371

Int. Cl.³ F24F *11/02*

U.S. Cl. 236—42 **13 Claims**



1. A thermostatic valve assembly, comprising, a stationary valve housing having a projecting portion with first and second cylindrical supporting surfaces, a base unit fixedly connected to said projecting portion, a regulating knob mounted in rotatable relation to and axially fixed relation to said base unit, said base unit having a slotted foot portion with a first annular bearing surface pushed over said first cylindrical supporting surface, said base unit having a second annular bearing surface outwardly from said first annular surface engaging said second cylindrical supporting surface, a ring member surrounding said slotted foot portion for securing said base unit to said housing, said ring member and said slotted foot portion having abutting surfaces for maintaining said ring member in a fixed axial position relative to said slotted foot portion, and adjusting means for said base unit which includes annular groove means in said housing projecting portion and wedge means connected to said ring member, said wedge means being cooperable with said groove means to effect axial movement of said base unit relative to said housing projecting portion.

4,508,264

HEATER COOLANT CIRCULATION SYSTEM FOR VEHICLE PROVIDING MATCHED HEATING FOR INTAKE SYSTEM AND PASSENGER COMPARTMENT

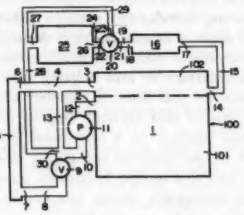
Keisou Takeda, and Toshiyuki Hirata, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 22, 1983, Ser. No. 516,333

Claims priority, application Japan, Aug. 20, 1982, 57-145075

Int. Cl.³ B60H *1/02*

U.S. Cl. 237—12.3 B **3 Claims**



1. A heater coolant circulation system for a vehicle comprising a passenger compartment and an engine which has a combustion air intake passage with a wall and a cooling system through which coolant is circulated, comprising:

a first heat exchanger system for exchanging heat between coolant flowing therethrough and said wall of said intake passage;

a second heat exchanger system having a coolant flow resistance for exchanging heat between coolant flowing therethrough and the interior of said passenger compartment;

a bypass conduit system having a coolant flow resistance which is larger than that of said second heat exchanger system; and

a changeover system which provides selectively either a first connection in which said first heat exchanger system and said second heat exchanger system are connected in series between a point in said cooling system of said engine at which relatively hot coolant is available at relatively high pressure and another point in said cooling system of said engine at which the coolant is at relatively low pressure without including said bypass conduit, or a second connection in which said first heat exchanger system and said bypass conduit system are connected in series between a point in said cooling system of said engine at which relatively hot coolant is available at relatively high pressure and another point in said cooling system of said engine at which the coolant is at relatively low pressure, without including said second heat exchanger system.

4,508,265

METHOD FOR SPRAY COMBINATION OF LIQUIDS AND APPARATUS THEREFOR

Morio Jido, Tokyo, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 356,086

Claims priority, application Japan, Jun. 18, 1981, 56-94157

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—3 **7 Claims**

4. An apparatus for the spray combination of a first liquid having a low dielectric constant and a second liquid having a high dielectric constant, which comprises:

a first flow path disposed at the center of a spray nozzle and adapted to permit said first liquid to flow,

a first electrode disposed inside said first flow path and formed so as to generate corona discharge and an electric field through which said liquid passes, thereby causing

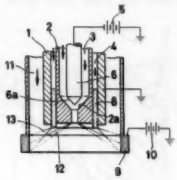
said first liquid to be ejected from the open end of said first flow path in the form of dispersed finely divided particles charged to one polarity,

a power source for applying a high potential of said one polarity to said first electrode,

an annular second flow path formed concentrically around said first flow path and adapted to allow said second liquid to flow,

a porous member disposed at the open end of said annular second flow path to finely divide the second liquid flowing therethrough,

an annular electrode disposed so as to surround the open end



of said annular second flow path at the leading end of said spray nozzle, and

a power source for applying to said second electrode a high potential of the polarity opposite that applied to said first electrode,

so as to subject the finely divided particles of said second liquid leaving said porous member to secondary splitting to establish much finer particles;

whereby finely divided particles of the first liquid charged to one polarity and finely divided particles of the second liquid charged to the polarity opposite that of said first liquid are electrostatically combined with each other and electrically neutralized.

4,508,266

METHOD OF CHANGING COLOR OF PAINTS FOR AN ELECTROSTATIC COATING MACHINE

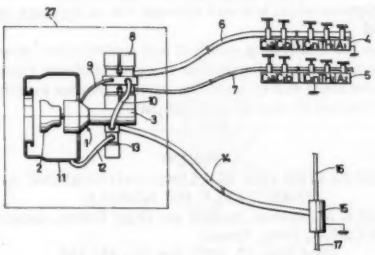
Eiiji Saito, Kamakura; Shoji Aizawa; Michio Mitsui, both of Yokohama; Tomohiko Miyata, Tokyo, and Masayuki Kuroda, Kawasaki, all of Japan, assignors to Ransburg Japan, Ltd., Tokyo, Japan

Division of Ser. No. 287,818, Jul. 28, 1981, Pat. No. 4,422,576. This application Jun. 10, 1983, Ser. No. 503,170

Claims priority, application Japan, Aug. 4, 1980, 55-106955

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—3 **2 Claims**



1. A method of changing color of paints to change between the paint of a preceeding color for coating a preceeding article and the paint of succeeding color for coating a succeeding article by using an electrostatic coating machine having a rotary atomizing head which is applied with a high voltage, a cleaning shroud reciprocatingly provided to move between a position surrounding said rotary atomizing head and retracted therefrom, a plurality of color change valve mechanisms for feeding paints and cleaning fluids to said rotary atomizing head, a first change-over valve provided at a position close to said rotary atomizing head, paint feed passages each of which consists of a major portion respectively connected to each of said color change valve mechanisms and to said change-over valve, and of a minor portion selectively communicated between said rotary atomizing head and said each major portion of said paint feed passages by way of said first change-over valve, a drain passage for recovering drainage from said cleaning shroud and said first change-over valve, a discharging section for forcively discharging the drainage from said drain passage, and a second change-over valve provided in the midway of said drain passage communicating from said cleaning shroud to said discharging section, which comprises:

a first cleaning step comprising interrupting the high voltage after the coating has been completed for the paint of the preceeding color, feeding the cleaning fluid at a high pressure and a great flow rate to the major portion of the paint feed passage and discharging the drainage of said cleaning fluid without flowing into the cleaning shroud;

a second cleaning step comprising feeding the cleaning fluid at a low pressure and in a low flow rate to the minor portion of the paint feed passage and the rotary atomizing head and discharging the drainage of said cleaning fluid by way of the cleaning shroud;

a first coating preparation step comprising feeding the paint of the succeeding color to said major portion of the paint feed passage and discharging a surplus of said paint without flowing into the cleaning shroud;

a second coating preparation step comprising feeding the paint of the succeeding color to the minor portion of the paint feed passage and the rotary atomizing head and discharging the surplus of said paint by way of the cleaning shroud; and

a third cleaning step comprising cleaning a portion of the drain passage at a high pressure and in a great flow rate in order to prevent metal bridging from occuring in the drain passage owing to an electro-conductivity of the surplus of said paint of the succeeding color upon application of a high voltage to the rotary atomizing head.

4,508,267

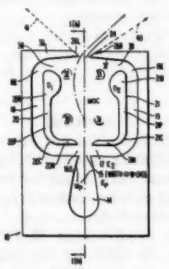
LIQUID OSCILLATOR DEVICE

Ronald D. Stouffer, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Columbia, Md.

Continuation-in-part of Ser. No. 112,248, Jan. 14, 1980, abandoned, and a continuation-in-part of Ser. No. 218,247, Dec. 19, 1980, abandoned. This application Apr. 5, 1983, Ser. No. 482,349

Int. Cl.³ B05B *1/08*

U.S. Cl. 239—11 **19 Claims**



1. In a liquid oscillator having an oscillation chamber, a power nozzle for introducing a liquid power jet into said chamber, an outlet throat downstream of said power nozzle and a

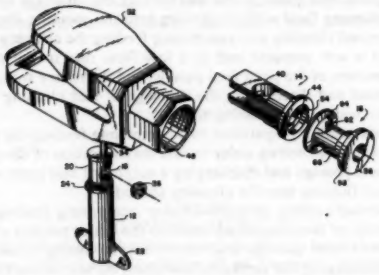
pair of passages having inlet openings to the respective sides of said oulet throat and exit openings adjacent said power nozzle, the improvement wherein said oscillation chamber includes a pair of mirror image wall surfaces beginning immediately downstream of said exit openings and extending to downstream therefrom and defining vortex forming chambers, the downstream end of each said wall surface being shaped to permit vortices formed in said vortex forming chambers to move thereover into said inlet openings, respectively, whereby said liquid power jet is caused to oscillate back and forth in said oscillation chamber.

4,508,268

REVERSIBLE SPRAY TIP

John D. Geberth, Jr., 10 Goose Cove La., Ramsey, N.J. 07446

Filed Dec. 21, 1982, Ser. No. 451,926
Int. Cl.³ B05B *15/02*
U.S. Cl. 239—119 **28 Claims**



1. A spray nozzle for use with a spray device adapted for hydraulically atomizing and spraying liquids, the spray device having a fluid passageway communicating with conduit means connected to a source of liquid under pressure, said spray nozzle including:

a. a housing, having a first axial bore therethrough and a second cylindrically shaped bore transverse thereto;

b. a cylindrical member transversely mounted for rotational movement in said cylindrically shaped transverse bore of said housing, said cylindrical member having a diametric bore therethrough terminating in a spray opening;

c. a sealing member in said first axial bore of said housing having an axial fluid bore therethrough communicating between the fluid passageway of said spray device and the diametric bore in said cylindrical member, the outlet end of said sealing member having a shape complimentary to and in abutting relationship with said cylindrical member;

d. means engaging said sealing member with said cylindrical member to prevent transverse movement of said cylindrical member in said housing;

e. means for securing said nozzle to said spray device and effecting sealing therebetween; and

f. means for rotating said cylindrical member.

4,508,269

CORNER WATERING SYSTEM FOR CENTER PIVOT IRRIGATION MACHINES

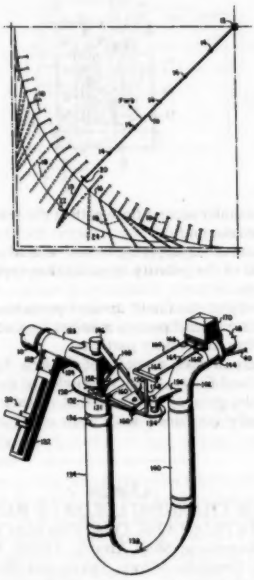
John E. Davis, Hebron; Terry L. Zielke, Deshler, and Ronald J. Coash, Hebron, all of Nebr., assignors to Reinke Manufacturing Co., Inc., Deshler, Nebr.

Division of Ser. No. 363,275, Mar. 29, 1983,. This application Nov. 14, 1983, Ser. No. 550,979
Int. Cl.³ B05B *3/12*
U.S. Cl. 239—177.2 **3 Claims**

1. In a center pivot irrigation machine having a main boom supported to pivot about one end and mounted on a plurality of mobile support units, an extension boom pivotally coupled with the opposite end of the main boom for irrigating corner areas of the field, a wheeled tower supporting said extension boom thereon, means for guiding said tower along a preselected path effecting pivotal extension of the extension boom into the corner areas approached by the main boom and pivotal retraction of the extension boom out of the corner areas as the main boom departs therefrom, first drive means for propelling said mobile support units, and second drive means for propelling said tower, the improvement comprising:

a double hinge structure interconnecting said main and extension booms;

a first generally vertical hinge axis on said double hinge



structure about which the extension boom can pivot relative to the main boom during extension into the corner areas and retraction out of the corner areas;

a second generally vertical hinge axis on said double hinge structure offset from said first hinge axis and cooperating therewith to permit relative linear movement between the extension boom and said opposite end of the main boom; and

means for controlling said first and second drive means in accordance with the angular orientation of said extension boom about said second hinge axis in a manner to maintain said tower on said preselected path.

4,508,270

APPARATUS FOR ROLLING AND GUIDING A DIRECTABLE JET NOZZLE

Raymond J. M. Joubert, Savigny sur Orge, France, assignor to S.N.E.C.M.A., Paris, France

Filed Mar. 12, 1982, Ser. No. 357,766
Claims priority, application France, Mar. 13, 1981, 81 05460
Int. Cl.³ B64C *15/00*
U.S. Cl. 239—265.35 **17 Claims**

1. A rolling and guiding apparatus for a directable jet propulsion nozzle, comprising:

a fixed part of said nozzle;

a cylindrical movable part of said nozzle movable with respect to said fixed part;

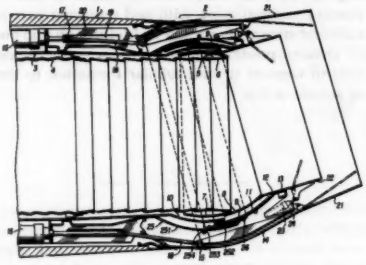
an exterior spherical structure fixed to said movable part of said nozzle;

control means connected between said fixed part and said exterior movable structure for activating the movement of said exterior movable structure;

guidance means disposed between said fixed part and said exterior movable structure for guiding the movement of said exterior movable structure;

a fixed interior spherical race fixed to an end of said fixed part of said nozzle;

a movable exterior spherical race fixed to said cylindrical movable part, said movable spherical race being concentric with, and exterior to, said interior fixed spherical race, said fixed interior race and said movable exterior race



being spaced from one another such that said movable exterior race is not supported by said fixed interior race;

sealing means fixed between said interior fixed and said movable spherical races; and

means for transmitting jet propulsion-generated loads from said cylindrical movable part of said nozzle to said fixed part of said nozzle, said means for transmitting comprising a fixed exterior spherical race fixed to said fixed part of said nozzle and extending coaxial with said fixed interior spherical race and exterior of said movable exterior spherical race, said means for transmitting further comprising rolling bearing means disposed between said fixed exterior spherical race and said movable exterior spherical race, said movable exterior race being supported by said fixed exterior race.

4,508,271

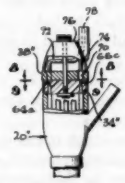
AIRBRUSH ASSEMBLY

Ronald A. Gress, 6921 Clinton, Hollywood, Calif. 90036

Filed May 3, 1982, Ser. No. 374,088

Int. Cl.[3] **A62C** *31/00*; **B05B** *12/14*

U.S. Cl. 239—305 **7 Claims**



1. A variable colorant blender for use with a painting apparatus for discharging colorant; said colorant blender comprising:

a plurality of discrete supply containers that contain respective different individual colorants;

means defining a plurality of supply paths connected to receive the individual colorants from the plurality of supply containers, respectively, the supply paths having respective supply-outlet openings that are disposed in a mechanical sequence;

colorant-pickup means that define a common pathway to the painting apparatus and that have an inlet end; and

adjustable means for moving the inlet end relative to the openings, along the mechanical sequence, to selectively align the inlet end to receive such colorant either from one of the supply-outlet openings or from any two adjacent supply-outlet openings, for supply to such painting apparatus;

the inlet end and the supply-outlet openings being mutually configured to provide a generally gradual gradation of colorant flow from any of the supply-outlet openings to the inlet end when the adjustable inlet-moving means are adjusted to move the inlet end toward, past, and beyond that particular supply-outlet opening.

4,508,272

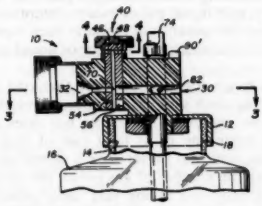
HOSE END SPRAY NOZZLE

Lincoln Thompson, 26 Carriage Rd., Cheshire, Conn. 06410

Filed Sep. 28, 1982, Ser. No. 425,503

Int. Cl.[3] **B05B** *7/30*

U.S. Cl. 239—318 **11 Claims**



1. Apparatus for selectively mixing fluids comprising:

a body, said body defining a first fluid passage which extends therethrough, said first fluid passage including a converging portion and a first constant diameter portion located downstream of said converging portion;

coupling means for connecting a source of first pressurized fluid to said body, said coupling means delivering the pressurized fluid to said first fluid passage whereby the velocity of said first fluid will be increased during flow through said converging portion prior to flow through said first constant diameter portion; and

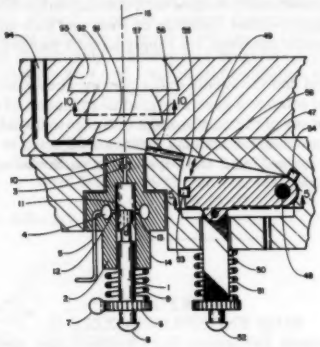
tube means rotatably mounted within said body, said tube means being closed at a first end and extending outwardly from said body to an open second end, said tube means intersecting said first constant diameter portion of said first fluid passage and extending partially into said constant diameter passage portion from a side thereof, said tube means thus forming a restriction in said first fluid passage, a low pressure area being created downstream of said restriction, said tube means being provided with a port extending through the wall thereof to establish communication between said first fluid passage and the interior of said tube means whereby the low pressure area downstream of said tube means may be placed in communication with the second end of said tube means to thereby establish a flow of a second fluid through said tube means into said first fluid passage for mixing with said first fluid, the rate of flow of the second fluid being controllable by rotation of said tube means to vary the area of said port which is in communication with said first fluid passage.

4,508,273

CROSSED PULSE LIQUID ATOMIZER

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115

Filed Sep. 22, 1982, Ser. No. 425,122
Int. Cl.³ B05B 7/08; F23C 11/04
U.S. Cl. 239—427 **6 Claims**



1. A liquid atomizer comprising:

at least one means for creating more than one liquid pulse and for directing each said liquid pulse to travel along a trajectory, said liquid pulser means comprising; means for controlling the quantity of liquid in each liquid pulse, and means for controlling the number of liquid pulses per unit of time;

at least one means for creating more than one gas pulse and for directing each said gas pulse to travel along a trajectory whose centerline intersects but does not coincide with the centerline of at least one of said liquid pulse trajectories, said gas pulser means comprising means for controlling the number of gas pulses per unit of time;

means for driving and timing said liquid pulser means and said gas pulser means so that each of said liquid pulses is impacted while traveling along said liquid pulse trajectory by at least one of said gas pulses while traveling along said gas pulse trajectories;

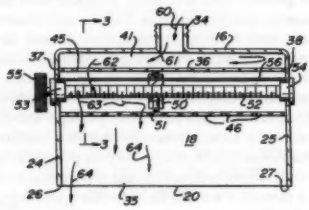
a cavity means for reflecting said gas pulses comprising solid gas pulse reflector surfaces which partially enclose the cavity of said cavity means so that, each of said gas pulses impacts liquid pulses at least twice and each of said liquid pulses is impacted by gas pulses at least twice and so that liquid pulses do not strike said reflector surfaces.

4,508,274

ADJUSTABLE FLOW COOLANT NOZZLE

Timothy J. Eichfeld, and Horace C. Disston, both of 217 S. Hurffville Rd., Deptford, N.J. 08096

Filed Nov. 15, 1983, Ser. No. 551,890
Int. Cl.³ B24B 55/02; B05B 1/20
U.S. Cl. 239—455 **8 Claims**



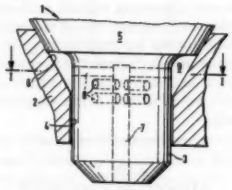
1. A coolant nozzle of variable width stream for a grinding wheel or the like, said nozzle comprising a hollow housing for location extending laterally across the working surface of a grinding wheel, a coolant inlet in an upper region of said housing, a coolant outlet extending laterally in a lower region of said housing between opposite sides thereof, a laterally extending elongate tubular formation in said housing, coolant receiving port means adjacent to one end of said tubular formation in fluid communication with said coolant inlet, coolant discharging port means extending longitudinally along a lower region of said tubular formation and communicating with said coolant outlet, said receiving and discharging port means being in direct fluid communication with each other, a control element shiftable in said tubular formation to close fluid communication between said receiving port means and a selected length of said discharge port means, the remaining length of said discharge port means communicating with said receiving port means to pass a coolant stream of selected width through said outlet, and control element positioning means for selectively positioning said control element in said tubular formation to obtain the desired stream width.

4,508,275

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

Karl Hofmann, Remseck, and Werner Banzhaf, Sindelfingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 25, 1980, Ser. No. 133,724
Int. Cl.³ F02M 61/10
U.S. Cl. 239—533.3 **4 Claims**



1. A fuel injection nozzle for internal combustion engines having:

a nozzle body having an injection port;

an inwardly opening valve needle;

a valve seat on which the valve needle rests;

a valve needle head arranged to protrude through the injection port; and

an annular chamber defined by the valve needle and the nozzle body downstream of the valve seat; wherein the valve needle includes:

a longitudinal bore which opens to the valve needle head;

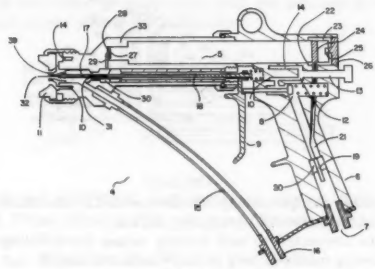
at least two connecting channels which branch from the longitudinal bore to the annular chamber, and which extend substantially transverse to the valve needle longitudinal axis, wherein the total cross sectional area of the at least two connecting channels is greater than the cross sectional area of the longitudinal bore to prevent throttling of fuel toward the injection port, and wherein at least one dimension of each of the at least two connecting channels is less than the longitudinal bore diameter to prevent foreign matter from entering the longitudinal bore from the annular chamber.

4,508,276

CURRENT LIMITED ELECTROSTATIC SPRAY GUN SYSTEM WITH POSITIVE FEEDBACK CONTROLLED CONSTANT VOLTAGE OUTPUT

David H. Malcolm, Randolph, N.J., assignor to Titan Tool Inc., Oakland, N.J.

Filed Sep. 29, 1982, Ser. No. 428,024
Int. Cl.[3] B05B *5/00*; H02H *3/00*
U.S. Cl. 239—691 **13 Claims**



1. In an electrostatic spray coating system wherein an electrode element is disposed adjacent the locus of coating material emission and said electrode element is subject to a desired magnitude of high voltage application thereto and to a load current flow therethrough dependent upon the physical parameters extant intermediate said locus of coating material emission and a workpiece being coated with said coating material,

an improved power supply for the high voltage charging of said electrode element, comprising

means for generating a low power, low voltage, high frequency alternating output,

transformer and voltage multiplying means for providing a high voltage d.c. output for application to said electrode element, and

power amplifying and control means disposed intermediate said generating means and said transformer and voltage multiplying means including means for varying the level of power output of said amplifier means for application to said transformer means in accord with the magnitude of the load current drawn through said electrode element to maintain the high voltage applied to said electrode substantially constant and independent of load for a predetermined range of load current values drawn therefrom.

4,508,277

APPARATUS FOR RECLAIMING FOUNDRY SAND

Robert S. L. Andrews, 7712 Incline Ter., Fort Worth, Tex. 76179

Continuation-in-part of Ser. No. 185,206, Sep. 8, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 346,235
Int. Cl.[3] B02C *19/12*; B22C *5/18*
U.S. Cl. 241—65 **3 Claims**

1. An apparatus for reclaiming foundry sand, comprising:

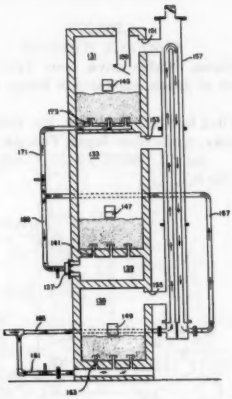
a preheat chamber having sidewalls, a floor, and an opening for receiving sand to be reclaimed;

a calcining chamber having sidewalls and a floor located directly beneath the floor of said preheat chamber in vertical fashion, said calcining chamber being connected to said preheat chamber by an external chute having a continuously open passageway for allowing the flow of sand downwardly between said preheat and calcining chambers;

a cooling chamber having sidewalls and a floor located beneath said calcining chamber in vertical fashion and being connected to said calcining chamber by an external chute having a continuously open passageway which allows the flow of sand downwardly between said calcining and cooling chambers;

vent means in the floors of said preheat chamber and cooling chamber for passing air upwardly through said chambers;

a firebox having a floor, sidewalls and a roof located immediately above said cooling chamber and immediately below said calcining chamber, said firebox having vent means in the roof thereof which is also the floor of said calcining chamber;



burner means mounted in said firebox for producing combustion within said firebox, the products of combustion in said firebox being vented through said firebox vent means into said calcining chamber to thereby generate excess heat in said calcining chamber; and

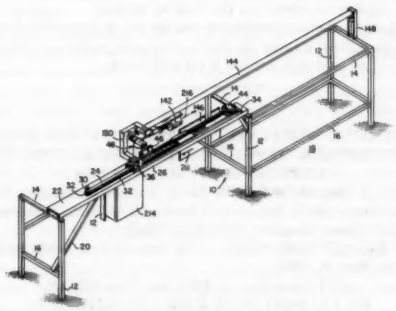
a blower unit for introducing air into the vent means of said preheat chambers and cooling chambers, as well as into said firebox, whereby sand is moved through said external passageways successively downwardly between said preheat calcining and cooling chambers.

4,508,278

TANDEM STRIPPING AND REVERSING APPARATUS

Robert N. Harris, Athens, Ga., and Michael E. McGuire, Olathe, Kans., assignors to Ericsson, Inc., Greenwich, Conn.

Filed Aug. 15, 1983, Ser. No. 523,065
Int. Cl.[3] B65H *54/00*; B29C *17/02*
U.S. Cl. 242—1 **14 Claims**



1. A method winding a cord to a coiled configuration having a coil tighter than the coil of said cord when disposed in a lay of winding on an elongated, rodlike element comprising continuously stripping said cord from said element while moving

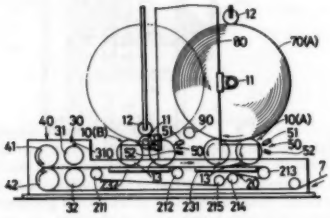
said element along a first path to a pay-off position, said cord after it is stripped being moved along a path of movement generally perpendicular to said first path, driving said cord along a second path from a fixed transition point while substantially simultaneously immobilizing said cord against rotation at said transition point, gripping an end of said cord, and reverse winding continuously the increasing increments of lengths of said cord between said gripped end and transition point in a direction opposite said initial direction of winding.

4,508,279

SURFACE WINDER

Masateru Tokuno, Nishinomiya, and Tetsuya Sawata, Nishigyou, both of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Filed Feb. 24, 1983, Ser. No. 469,276
Claims priority, application Japan, Feb. 24, 1982, 57-29600
Int. Cl.³ B65H *19/20, 17/08*
U.S. Cl. 242—56 R **9 Claims**



1. A surface winder having plural winding devices for winding rolls from a web of sheet material, each winding device including a pair of spaced supporters for supporting a winding core rotatably, a rider roll for pressing a wound roll during winding and a pair of rotatable drums for supporting and rotating the wound roll during winding, characterized by

(a) one drum of said pair of drums of each winding device being capable of attracting a portion of the web to its circumferential surface by suction,

(b) web guide means disposed below the winding devices operative to direct the web selectively to the drums of one or the other of said winding devices,

(c) a cutting device disposed upstream of said web guide means to sever the web periodically, thereby producing a cut web having a leading end portion,

(d) web feeding means operative to deliver the web, after it has been severed, to said web guide means and

(e) adhesive application means disposed adjacent each drum capable of attracting the web by suction,

(f) said adhesive application means being operative to form an adhesive layer on the leading end portion of the web when said end portion is on said drum.

4,508,280

TAPE DECK WITH TAKE-UP REEL ROTATION SENSOR CONFIGURED TO PREVENT TAPE WINDUP ON THE CAPSTAN OR PINCH ROLLER

Robert J. Hayosh; Robert H. Lewis, both of Farmington Hills, and Frederick A. Simon, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01768, § 371 Date Nov. 9, 1983, § 102(e) Date Nov. 9, 1983
PCT Filed Nov. 9, 1983, Ser. No. 565,768
Int. Cl.³ B65H *59/38;* **G03B** *1/02;* **G11B** *15/13*
U.S. Cl. 242—191 **8 Claims**

8. A mechanism for transporting a length of tape material from a supply reel to a take-up reel including:

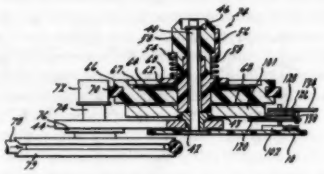
means defining a mounting platform;

a supply reel spindle and a take-up reel spindle rotationally mounted on said platform means and positioned for accepting respective supply and take-up reels;

means connected to said platform means for driving said take-up reel spindle in a first predetermined rotational direction;

multipolar magnetic field producing means mounted to rotate with said take-up reel spindle;

means adjacent said magnetic field producing means for



sensing changes in magnetic field caused by the rotation of said magnetic field producing means;

means connected to said sensing means for enabling said driving means as long as said rotation is sensed; and

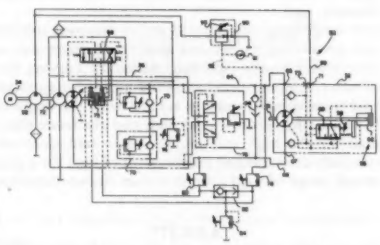
means between said magnetic field producing means and said sensing means for blocking the magnetic field from said sensing means when said take-up reel spindle and said magnetic field producing means are rotated in a direction opposite to said first predetermined rotational direction.

4,508,281

HYDRAULIC DRIVE SYSTEM FOR CABLE STRINGING APPARATUS

Robert J. Plater, Shreveport, La., assignor to TSE International, Shreveport, La.

Filed Aug. 15, 1983, Ser. No. 523,649
Int. Cl.³ B65H *59/38;* **B66D** *1/50*
U.S. Cl. 242—54 R **9 Claims**



1. Apparatus for stringing aerial electrical cables and the like at relatively constant predetermined tension, said apparatus comprising:

a rotary drum rotatably mounted on means for supporting said drum, said drum including a core on which a flexible line such as a messenger line or cable is wound in coils of increasing radius with respect to an axis of rotaion of said drum, and a hydraulic drive system including:

(a) a variable displacement hydraulic motor drivably connected to said drum, said motor including a pressure responsive controller for increasing motor output torque in response to sensing increasing pressure of fluid supplied to said motor from a given supply pressure

(b) a pump for supplying pressure fluid to said motor and means for selectively varying the pressure of said fluid delivered to said motor by said pump; and

(c) control means for controlling said motor to rotate said drum to increase the driving torque on said drum as said line is wound thereon to maintain said predetermined

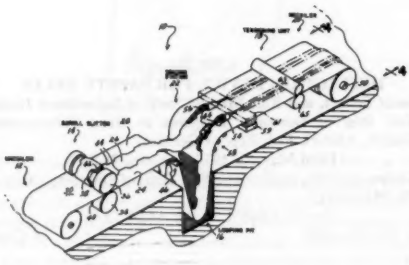
tension on said line, said control means including means for supplying pilot pressure fluid at a preselected pressure to said controller to decrease the pressure set point at which motor torque is increased in response to a tendency to increase said supply pressure of fluid supplied to said motor, said means for supplying pilot pressure fluid including a proportional pressure relief valve operable to sense increasing fluid supply pressure to said motor and reduce the pressure of said pilot pressure fluid signal to said controller in accordance with the increase in said fluid supply pressure to said motor.

4,508,282

SCROLL SLITTING AND REWIND APPARATUS

John R. Eiting, Minster, Ohio, assignor to Precision Strip, Inc., Minster, Ohio

Filed Mar. 25, 1983, Ser. No. 478,984
Int. Cl.³ B65H *23/10, 35/02*
U.S. Cl. 242—56.2 **2 Claims**



1. A scroll cutting line for cutting a single web of sheet stock material into multiple scroll cut strips, said line comprising,

an uncoiler station including means for supporting an arbor having a web of sheet stock material wound thereon,

a scroll cutting station including rotary cutter means for driving the web and for converting said single web of sheet stock material into multiple strips, each of said strips having at least one serpentine shaped scroll cut edge,

a recoiling station located downstream from said cutting station, said recoiling station including means for supporting a single rewind arbor and means for driving said rewind arbor in rotation to rewind all of the scroll slit strips of said web of stock material onto said single arbor without any overlap of said strips on said single arbor,

a tensioning station located upstream of said recoiling station and including means for applying a tension to said strips as said strips are wound upon said rewind arbor,

a looping pit located between said cutting station and said tensioning station, said looping pit being open at the top and extending downwardly a substantial distance below the floor level of said cutting line so as to provide for substantial slack in said strips between said cutting station and said tensioning station, and

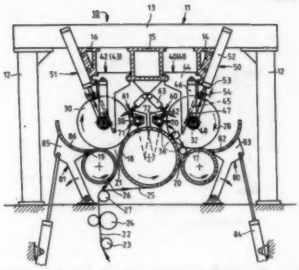
spacing means located between said strips of scroll slit material upstream of said tensioning means for fanning said strips apart and establishing a gap between said strips before said strips enter said tensioning means, said gap being at least equal to the amplitude of the serpentine shaped edge of said strips so that said strips do not overlap when wound onto said single rewind arbor.

4,508,283

WINDING MACHINE FOR WINDING A WEB SLIT LENGTHWISE

Rudolf Beisswanger, Steinheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Nov. 15, 1983, Ser. No. 551,954
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3243994
Int. Cl.³ B65H *17/12, 19/06*
U.S. Cl. 242—56.4 **15 Claims**



1. A winding machine adapted simultaneously to wind strips of web onto at least two winding rolls formed on at least two core tubes, respectively, the strips being slit lengthwise from a web and offset relative to each other, said winding machine including a frame having three generally horizontally disposed supporting rollers therein, the longitudinal axes of said supporting rollers being generally parallel to each other, each two adjacent ones of said supporting rollers forming a winding bed therebetween; at least two holding assemblies adapted to engage the ends of the respective core tubes; and at least two removal means adapted to remove the respective rolls, characterized in that:

said three supporting rollers are adjacently disposed such that each said winding bed extends above the common center axis plane of its said adjacent rollers, wherein the web strips are supplied from below and into respective said winding beds and against one of said supporting rollers forming their respective said winding beds,

at least two ejection means are disposed above the center one of said supporting rollers and adapted to move generally simultaneously the rolls from their respective said winding beds and over the adjoining one of the two outermost ones of said supporting rollers,

said at least two removal means are disposed adjacent to respective outermost ones of said supporting rollers,

at least two inserting means are disposed above said three supporting rollers and adapted to insert new core tubes into respective said winding beds,

severing means adapted to sever the web strip when rolled, and

at least two attaching means adapted to attach new web strips to the new core tubes.

4,508,284

APPARATUS FOR CONTROLLING WINDING TENSION

Hiroshi Kataoka, Iyo-mishima, Japan, assignor to Kataoka Machine Product Co., Ltd., Ehime, Japan

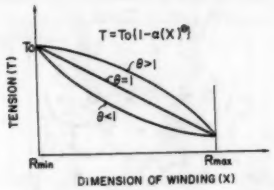
Continuation of Ser. No. 416,917, Sep. 13, 1982, abandoned, which is a continuation-in-part of Ser. No. 174,579, Aug. 4, 1980, abandoned, which is a division of Ser. No. 41,410, May 22, 1979, Pat. No. 4,238,084, which is a continuation of Ser. No. 660,632, Feb. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 485,618, Jul. 3, 1974, abandoned. This application Jan. 12, 1984, Ser. No. 569,940

Claims priority, application Japan, Jul. 6, 1973, 48-76396

The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.

Int. Cl.³ B65H *23/20*

U.S. Cl. 242—75.51 **1 Claim**



1. A sheet winding control device for a winder of a center drive type having a structure for adjusting the sheet winding torque of a core of a winding roll, said device comprising:

means for detecting the winding length of the sheet; means for evaluating the desired winding tension of the sheet from the detected winding length of the sheet and for producing a tension signal by generating a signal proportional to the intial winding tension, generating a signal proportional to the actual winding length, dividing said last mentioned signal by a signal proportional to the total winding length to obtain a signal representing a variable (x), multiplying the signal representing the variable (x) by the signal representing the initial winding tension and by a constant predetermined signal representing the rate of change of the tension, and subtracting the resulting signal from the signal representing the initial tension;

means for detecting a winding radius of the sheet on the winding roll and producing a winding radius signal;

torque calculating means for multiplying the tension signal by the winding radius signal to convert thereby the tension signal into a torque control signal; and

means for driving a torque actuator according to the torque control signal from said torque calculating means.

4,508,285

CABLE BRAKE

Robert E. McMillan, 171 Orange Rd., Montclair, N.J. 07042

Continuation-in-part of Ser. No. 129,230, Mar. 11, 1980, Pat. No. 4,317,507. This application Jan. 7, 1982, Ser. No. 337,870

Int. Cl.³ B65H *59/02*

U.S. Cl. 242—99 **15 Claims**

1. A cable brake system comprising:

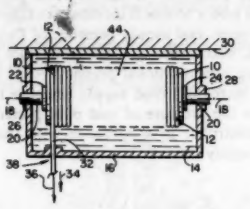
(a) a generally closed container means;

(b) reel axle means coupled to said container means at opposite ends thereof and having a longitudinal axis;

(c) a reel, said reel having an axis, said axis of said reel being co-extensive with the axis of said reel axle means, said reel being carried by said axle means and rotatable about said axle means axis but not displaceable along said reel axle means;

(d) a flexible cable means, said cable means being wound about said reel; and

(e) a viscous fluid filling said container means immersing said reel and associated cable means in said viscous fluid, so that the unwinding of said reel causes said reel to turn



about said axle means axis in said viscous fluid, thereby producing resistance to motion and a braking action.

4,508,286

DEFLECTION DEVICE FOR SAFETY BELTS

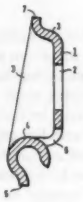
Helmut Seifert, and Karl Möndel, both of Schwäbisch Gmünd, Fed. Rep. of Germany, assignors to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed May 11, 1979, Ser. No. 38,326

Claims priority, application Fed. Rep. of Germany, May 12, 1978, 7814486[U]

Int. Cl.³ B65H *75/48;* **A62B** *35/00*

U.S. Cl. 242—107 **6 Claims**



1. Deflection device for a safety belt in a motor vehicle in which one end of the safety belt is rolled up on an automatic winder in an end region and the other end of the belt is adapted for locking engagement with a lock, a belt portion between the automatic winder and the lock routed over a fixed rounded deflection bar, said deflection device having said rounded deflection bar and a flat mounting plate which are surrounded by a closed frame formed in a continuous arch, said deflection device formed by a metal stamping with an opening in said flat plate for securing the device to the motor vehicle and a second opening formed by stamping out a portion of said plate and through which said belt passes and by shaping the end of the metal stamping and constituting said deflection crossbar having a rounded surface in the contact area with the belt, said deflection crossbar in the contact area with the belt having a cross section in the form of an open curve having an uninterrupted surface continuing through said second opening for contact with the belt and with both ends of said open curve extending downwardly.

4,508,287

WINDING ATTACHMENT FOR SAFETY BELTS IN VEHICLES

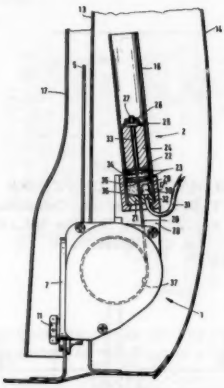
Karl E. Nilsson, Ottobrunn, Fed. Rep. of Germany, assignor to Bayern-Chemie Gesellschaft für flugchemische Antriebe mit beschränkter Haftung, Fed. Rep. of Germany

Filed Apr. 27, 1983, Ser. No. 489,054

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 3215926

Int. Cl.³ A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107 **7 Claims**



1. A winding attachment for passenger safety belts in vehicles, comprising an automatic takeup roller over which the belt is entrained, a roller shaft connected to said takeup roller for rotation therewith, and at least one clutch disc connected to said shaft and being rotatable to drive said shaft in a direction to cause the roller to rotate and retighten the seat belt, at least one cylinder having a closed end and an opposite end, a piston movable in said cylinder, a pyrotechnical charge in said cylinder, means for igniting said charge to generate propellant gases to move said piston toward and out of the open end of said cylinder, a tension member having one end connected to said piston and being engaged around said clutch disc, said piston being movable with said tension member to cause said clutch to drive said takeup roll in a direction to tighten the seat belt, and an additional weight of a size selected in accordance with the kinetic energy necessary to tighten the seat belt connected to said piston for movement with said piston out of said cylinder open end, the length of the cylinder being selected so that the piston and weight will leave the cylinder when the charge is ignited.

4,508,288

WINDING ATTACHMENT FOR BELTS

Karl E. Nilsson, Ottobrunn, Fed. Rep. of Germany, assignor to Bayern-Chemie Gesellschaft für flugchemische Antriebe mit beschränkter Haftung, Fed. Rep. of Germany

Filed Apr. 27, 1983, Ser. No. 489,078

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 3215928

Int. Cl.³ A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107 **6 Claims**

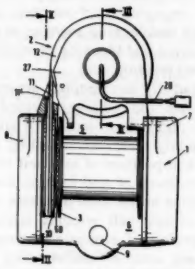
1. A winding attachment for passenger seat belts for use with a windable take-up roller over which the seat belt is wound and which includes a roller shaft, and a rotatable clutch disc connected to the roller shaft when the disc is rotated in a belt winding direction, comprising:

a frame;

a piston shaft rotatably mounted to said frame, said piston shaft having a plurality of piston vanes fixed thereto and evenly distributed around said piston shaft;

a cylinder rotatably mounted to said frame and defining a space, said cylinder having a plurality of cylinder vanes fixed thereto and extending into said space, a number of cylinder vanes equalling a number of piston vanes and said piston vanes movable in said space and interleaved between said cylinder vanes, said cylinder vanes being evenly distributed around said cylinder and each defining a chamber with an adjacent piston vane;

a pyrotechnic charge in said piston shaft, with passages defined to each chamber for supplying expanding gas to each chamber with ignition of said pyrotechnic charge; and



an overriding clutch connected between said piston shaft and said frame for permitting rotation of said piston shaft on a winding direction only and blocking rotation of said piston shaft in an unwinding direction for the seat belt on the take-up roller whereby upon ignition of said pyrotechnic charge, said cylinder rotates in a winding direction to wind the seat belt on the take-up roller until said cylinder vanes meet said piston vane, and thereafter said piston shaft and said cylinder rotate together in the winding direction so that kinetic energy of the cylinder is provided to the piston shaft.

4,508,289

ROLL-UP DEVICE FOR SAFETY BELTS

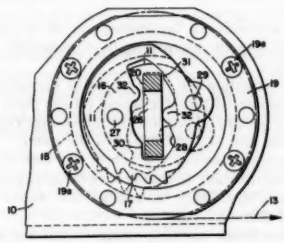
Klaus-Peter Singer, Hamburg, and Klaus Butenop, Herzhorn, both of Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Dec. 31, 1981, Ser. No. 336,177

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1980, 3049564

Int. Cl.³ A62B *35/02;* B65H *75/48, 75/42;* B60R *21/10*

U.S. Cl. 242—107.4 B **18 Claims**



1. A roll-up device for a safety belt, said device providing automatic blocking of a belt winding spindle in the event acceleration exceeding a threshold value acts on the belt and/or on a support for the roll-up device, said device comprising:

a housing, notches being associated with said housing;

a belt winding spindle having two ends and being mounted in said housing in such a way as to be rotatable relative thereto, said belt being wound on and unwound from said belt winding spindle;

a projection provided on one end of said belt winding spindle and having a free end remote from said spindle;

a radially deflectable locking member operatively associated with said belt winding spindle via said projection thereof, said locking member and said projection cooperating to permit said spindle to assume at least two different operating positions, namely a blocked position, and a rest position which permits said winding and unwinding of said belt; said locking member being provided with at least one detent for engaging said notches of said housing to thereby lock said locking member in a blocking position and hence effect said blocking of said belt winding spindle in its blocked position; and

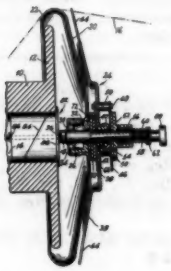
at least one radially overlapping arrangement operatively associated with, and radially provided between, said locking member and said projection of said spindle, said radially overlapping arrangement acting at least temporarily in said blocked position of said belt winding spindle as to prevent movement of said locking member out of its intended position in the axial direction of said spindle, said projection of said belt winding spindle being provided with an opening of elongate rectangular construction, with the long sides of said opening extending at right angles to the axis of said spindle.

4,508,290

CAP ASSEMBLY WITH FRICTION DRAG ON TENSION BRUSH

Gordon L. Bauer, Shelton, Conn., assignor to Wyrepak Industries, Inc., Bridgeport, Conn.

Filed Feb. 6, 1984, Ser. No. 577,440
Int. Cl.[3] B65H *49/00, 59/00*
U.S. Cl. 242—128 **18 Claims**



1. A cap assembly for facilitating pay-off of wire past one end flange of a spool, comprising in combination:

(a) a shaft,

(b) means mounting the shaft at one of the spool ends,

(c) a non-powered turnable wheel on the shaft, said wheel having a peripheral portion extending adjacent the periphery of the said one end flange of the spool,

(d) a bearing mounting the wheel for free rotation with respect to the shaft, to enable wire being payed off the said one spool end flange to engage the wheel and impart rotation thereto,

(e) a tension brush assembly comprising a hub rotatable on said shaft and a brush body carried by the hub, said brush body having a plurality of radially extending, flexible and resilient tines disposed adjacent the periphery of the wheel, said tines being adapted to be brushed by the strand of wire as it passes over the wheel periphery,

(f) means mounting the brush assembly at the said one end flange of the spool, for rotation under the influence of the strand brushing past the tines, and

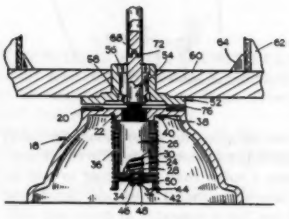
(g) means for imparting an adjustable braking force to the brush assembly so as to slow its rotation whereby the circumferential velocity of the tines can be adjusted to a value less than the orbital speed of the strand of wire past the periphery of the spool flange.

4,508,291

WELDING WIRE DISPENSER

Delmar D. Kosch, 1730 Woodland Dr., Columbus, Nebr. 68601

Filed Sep. 27, 1984, Ser. No. 655,230
Int. Cl.[3] B65H *59/04*
U.S. Cl. 242—156.2 **3 Claims**



1. A welding wire dispenser for dispensing wire to a wire feeder,

a support means having a horizontally disposed annular portion at its upper end,

a ball screw assembly comprising an outer housing portion rigidly secured to said support means, a vertically disposed, rotatable screw mounted in said outer housing portion and extending upwardly therefrom,

a vertically disposed and vertically movable shaft secured to the upper end of said screw and extending upwardly therefrom,

a coil support means rotatably mounted on the upper end of said shaft above said support means and vertically movable with said shaft, said coil support means having a horizontally disposed annular portion at its lower end adapted to frictionally engage said annular portion on said support means to limit the rotation of said coil support means when said annular portions are in frictional engagement with each other, said coil support means adapted to support a coil of welding wire thereon,

an arm means removably secured to the upper end of said shaft and having an outer end portion disposed laterally of the coil of wire on the coil support means,

and a pulley rotatably mounted about a vertical axis on the outer end portion of the arm means adapted to have the welding wire on the coil extending therearound,

said screw moving upwardly relative to said outer housing portion and said support means thereby vertically moving said shaft so that said annular portions will not be in frictional engagement with each other so that said coil support means may freely rotate when said arm means is moved toward the wire feeder.

4,508,292

TAPE LOOP SENSING ARM AND TAPE GUIDE FOR MAGNETIC TAPE RECORDING AND PLAYBACK MACHINES

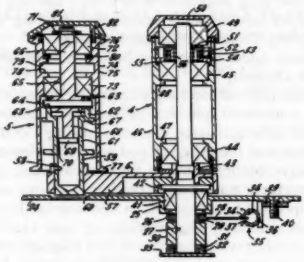
Stefan Kudelski, Le Mont-sur-Lausanne, Switzerland, assignor to Ampex Corp., Redwood City, Calif. and Kudelski, S.A., Lausanne, Switzerland

Filed Sep. 15, 1983, Ser. No. 533,093

Claims priority, application United Kingdom, Sep. 17, 1982, 8226575

Int. Cl.³ B65H *59/38*; G11B *15/32*

U.S. Cl. 242—190 **8 Claims**



1. A tape loop sensing arm for guiding tape and for pivotal movement in response to alteration of a tape loop, said arm comprising:

pivot means defining a pivot axis;

an arm member disposed on said pivot means for rotation about a first axis;

a cylindrical tape-engaging guide member;

support means comprising a spindle defining said rotary axis;

bearing means mounting said guide member for rotation about said spindle;

means for mounting said spindle for pivotal movement about said pivot axis;

said support means mounting said guide member on said arm member for rotary tape guiding movement about a rotary axis generally parallel to said first axis, and

permitting pivoting of the guide member about a pivot axis normal to said first axis without significant alteration of the effective sensing length of the arm.

4,508,293

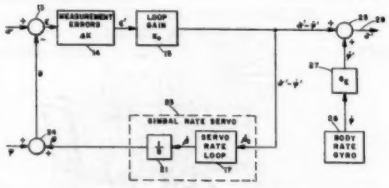
SEEKER-BODY DECOUPLING SYSTEM

Richard W. Jones, La Verne, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Jul. 12, 1982, Ser. No. 397,255

Int. Cl.³ F41G *7/22*

U.S. Cl. 244—3.15 **8 Claims**



1. A method for body motion decoupling of a body gimballed antenna in a proportional navigation missile guidance system for a missile airframe, said guidance system comprising a track loop, a guidance/control section and a body rate gyro having a body rate output ψ, said track loop having inputs representing body angle ψ and LOS angle δ and deriving antenna angle θ, said track loop including a loop gain K_ϵ and measurement errors which together comprise a receiver, said method comprising the steps of:

combining angles δ and θ at a first combining point to provide an output signal ϵ representing the antenna pointing error;

multiplying the angle ϵ by said measurement errors and said loop gain to provide a first measured LOS rate σ' at the output of said receiver;

combining LOS rate σ' and body rate ψ' at a second combining point to provide antenna command signal $\beta_c=\sigma'-\psi'$;

applying said command signal to a gimbal rate servo to position said antenna, the output of said gimbal rate servo being the antenna position with respect to the airframe or look angle β where $\beta=\sigma''-\psi'$;

coupling said body angle ψ and said look angle β at a third combining point to provide said antenna angle θ;

differentiating said look angle β to provide $\sigma''-\psi'$; and

combining said body rate ψ' with $\sigma''-\psi'$ at a fourth combining point to provide a refined second LOS rate σ'' for use by said guidance/control section of said guidance system.

4,508,294

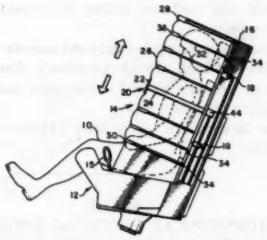
AIR BAG RESTRAINT SYSTEM

Daniel L. Lorch, Holland, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1983, Ser. No. 490,827

Int. Cl.³ B64D *25/04*

U.S. Cl. 244—122 AG **7 Claims**



1. A restraint system for protecting an occupant during ejection from a high-performance aircraft, comprising:

an ejection seat;

support means releasably mounted to said seat and extended transversely about the chest of the occupant for confining the occupant in a predetermined envelope during all flight maneuvers;

an inflatable member, attached along the center portion of its forward-facing surface to the chest side of the transverse extension of said support means, normally stored uninflated and tightly folded adjacent to said support means, said inflatable member encapsulating the head, arms and torso of the occupant when inflated;

a plurality of positioning members coupled at their ends to said support means and coextending transversely about the chest of the occupant, contiguously attached at spaced intervals about the forward-facing surface of said inflatable member, for guiding and restraining the deployment of said inflatable member from the stowed position to the encapsulating position; and

inflating means operatively connected to said inflatable member for deployment thereof from the stowed position to the encapsulating position.

4,508,295

DEVICE FOR DETECTING AND PREVENTING THE FORMATION OF ICE ON CONTOURED SURFACES

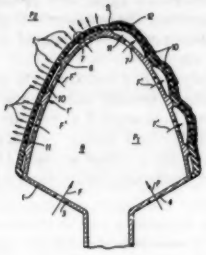
Christian J. Cattaneo, Lissy; Patrick R. J. Derouet, Soignolles en Brie, and Michel C. F. Laroche, Le Mee sur Seine, all of France, assignors to S.N.E C.M.A., Paris, France

Filed Jun. 9, 1983, Ser. No. 502,701

Claims priority, application France, Jun. 9, 1982, 82 10004

Int. Cl.³ B64D *15/04, 15/18, 15/22*

U.S. Cl. 244—134 A **15 Claims**



1. A device for detecting and preventing the formation of ice on contoured surfaces, comprising:

a rigid hollow support structure including a contoured surface;

a deformable wall covering said contoured surface;

means for providing an airtight securement between said support structure and said deformable wall along a plurality of lines of contact, whereby a plurality of elementary chambers are defined by said support structure, said deformable wall and said means for providing an airtight securement;

at least one first opening between the interior of said support structure and each of said elementary chambers;

at least one opening in said deformable wall at each said elementary chamber; and

means for feeding hot gas to said interior of said support structure.

4,508,296

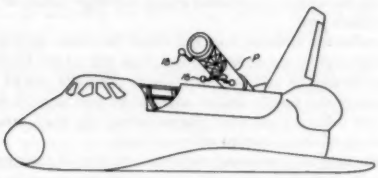
HEMISPHERICAL LATCHING APPARATUS

Keith H. Clark, Decatur, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 23, 1982, Ser. No. 401,282

Int. Cl.³ B60P *7/08;* **B61D** *45/00;* **B64G** *1/00*

U.S. Cl. 244—158 R **9 Claims**



1. A payload retention system for securing and retaining a gimballed payload in a fixed docked position on a platform in a cargo bay of a space vehicle for flight in outer space which payload is shiftable to an extended position comprising:

a plurality of latching members;

a plurality of latching assemblies carried by said platform each of said latching assemblies including one of said latching members;

a plurality of payload latching elements carried by said payload;

a first of said latching elements being carried in interlatching alignment with a first latching member of a first of said latching assemblies defining a first latch coupling along a first coupling axis;

a second of said payload latching elements being carried in interlatching alignment with a second latching member of a second of said latching assemblies defining a second latch coupling along a second coupling axis;

a third of said payload latching elements being carried in interlatching alignment with a third latching member of a third of said latching assemblies defining a third latch coupling along a third coupling axis:

each said latch member including a contoured spherical latch element;

each said payload latching element including a complementary contoured spherical payload latch element;

one said spherical latch elements having a convex latching surface and the other of said spherical elements having a concave latching surface, said concave and convex latching surfaces mating and coupling with one another along a respective coupling axis in said interlatching alignment;

said spherical latch elements having their axes aligned with one another when coupled in said interlatching alignment wherein said payload is retained in said fixed docked position;

said spherical latch elements allowing free rotation about their respective coupling axis while limiting movement along the axes;

said spherical latch elements being arranged on said platform and payload so that engagement and axial coupling of the spherical elements of one of said latch couplings due to movement of said payload to said storage position gradually forces alignment of the coupling axes and coupling of the spherical latch elements of the remaining latch couplings and

said first latch member exerting a latching force on said first latch coupling opposing the latching forces exerted by said second and third latch members of said second and third latch couplings so that said payload is retained in said storage position.

4,508,297

SATELLITE ON AN EQUATORIAL ORBIT WITH IMPROVED SOLAR MEANS

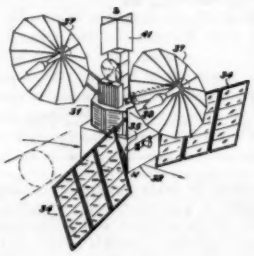
Guy G. Mouilhayrat, Ramonville; Paul A. J. Duchon, Venerque; Jean M. A. M. Guilbert, Montgiscard, and André A. Rolfo, Castanet, all of France, assignors to Centre National d'Etudes Spatiales, Paris, France

Filed Feb. 24, 1983, Ser. No. 469,317

Claims priority, application France, Mar. 2, 1982, 82 03412

Int. Cl.³ B64G *1/44*

U.S. Cl. 244—173 **2 Claims**



1. An equatorial orbit satellite comprising a platform having

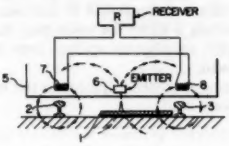
two axes located in the orbital plane of the satellite and an axis perpendicular to said plane, said platform having an antisolar face; a payload; means fixed to the platform for orienting the platform axis perpendicular to the orbital plane in the North-South direction; a solar sensor also fixed to the platform and directed towards the sun; two solar panels formed by two blades symmetrically connected to the platform, said blades each having a medium line inclined by a certain angle relative to the equatorial plane; actuation means located in the platform; communication antennas integral with the payload; and means fixed to the payload for orienting one axis of the payload in the direction of the earth.

4,508,298

APPARATUS FOR LOCALIZING OF A TRAIN

Jean P. Salmon, Aulnay sous Bois, France, assignor to Jeumont-Schneider, France

Filed Jun. 10, 1982, Ser. No. 387,173
Claims priority, application France, Jun. 10, 1981, 81 11371
Int. Cl.³ B61L *3/00*
U.S. Cl. 246—167 R **5 Claims**



1. Apparatus for localization of a train circulating on a two-rail steel track, having, in combination, on board the train, radio-frequency emitter means tuned to a predetermined radio frequency and receiver means tuned to the same frequency and provided with two detectors situated above said rails, respectively, and, on the ground, a passive radio-frequency circuit tuned to the same frequency and positioned to receive a radio-frequency signal from said emitter means, said apparatus having means for preventing said emitter means from producing an output in said receiver means except when said emitter means induces a signal in said passive radio-frequency circuit, said radio-frequency circuit being more closely coupled to one of said detectors than to the other such that a signal induced in said circuit from said emitter means induces a signal in said one detector and thereby produces an output in said receiver means.

4,508,299

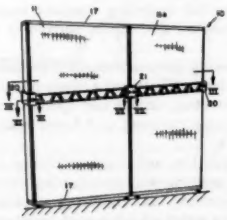
Patent Not Issued For This Number

4,508,300

SUPPORT BRACKET FOR ACCESSORY BEAM

Harold N. Minick, Tryon, N.C., assignor to Wolff Wire Corporation, Ludington, Mich.

Filed Sep. 23, 1982, Ser. No. 422,220
Int. Cl.³ A47B *96/06*
U.S. Cl. 248—216.1 **2 Claims**



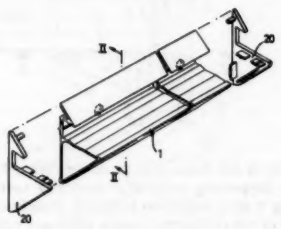
1. An accessory support bracket and accessory mounting beam for use on movable panel walls consisting of panels joined together in edge-to-edge relationship, said panels having a rigid penetratable core member covered on each face with decorative fabric, said bracket characterized in that it has inner and outer anchor members, said inner anchor member having a leg to seat against an edge of a panel, a vertically elongated first flange on one end extending normal to the plane of said leg and adapted to seat against the inner face of the panel; needle-like teeth on the end of said first flange for penetrating the inner face of the panel; a second flange forming a head portion on the outer end of said inner anchor member, said outer anchor member including a cap portion seated over the head portion of said inner anchor member and said cap portion having a pair of parallel flanges extending in the same direction as said leg; needle-like teeth on the inner ends of said flanges directed toward said teeth on said inner bracket for penetrating and gripping the panel; a portion of an accessory mounting beam being seated between said inner and outer anchor members; a fastener connecting said inner and outer anchor members for drawing them together to clamp both said panel and said beam between them.

4,508,301

SHELF SUPPORT

Timothy J. H. Nicholson, Rectory Cottage, Sulhamstead Abbots, Reading, Berkshire; Andrew L. Lee, 10, Brunswick Rd., Kingston-upon-Thames, Surrey, and Clifford Roberts, 11, Bathurst Ave., Merton Park, London SW 19, all of England

Filed Dec. 28, 1983, Ser. No. 566,286
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 8328175[U]
Int. Cl.³ A47G *29/02*; E04G *3/08*
U.S. Cl. 248—250 **15 Claims**



1. A shelf support for engaging a rear portion of a rectangular section shelf having an underside and a top and holding said shelf as a cantilever, said shelf support being formed as an elongate member so that the support can extend along a substantial part of the length of a rear portion of said shelf, said shelf support comprising:

mounting means for mounting said shelf support on an upright surface, said mounting means having a rear surface for engaging said upright surfaces;

support means carried by said mounting means and comprising first and second support parts at substantially the same level for engaging a rear portion of said underside of said shelf, said second support part being spaced behind said first support part whereby said second support part is nearer said mounting means rear surface than is said first support part;

retaining means carried by said mounting means for engaging a rear portion of said top of said shelf, said retaining means having a downwardly extending lowermost retaining part which is spaced above said first and second support parts and positioned nearer said mounting means rear surface than said first support part but further from said mounting means rear surface than said second support part, said retaining part being movable upwards with respect to said support means by the application of only substantial vertical upwards force to said retaining part,

said retaining means and said support means defining a gap for receiving and frictionally engaging said rear portion of said shelf; and

wedge means having a wedge surface inclined forwardly at a small angle to the horizontal portion for engagement by said rear of said shelf, the vertical distance between the end of said wedge surface which is furthest from said mounting means rear surface and the opposite side of said gap being greater than the vertical distance between said retaining part and said first support part or said second support part, whereby when said shelf is pushed generally horizontally back towards said upright surface, wedging action of said wedge surface causes said retaining part to move upwardly with respect to said support means.

4,508,302

FURNITURE FITTING

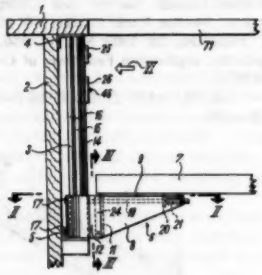
Horst Häusser, Rudersberg, Fed. Rep. of Germany, assignor to Horst Häusser Metallwaren GmbH, Rudersberg, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 421,980

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1981, 3151986

Int. Cl.³ E04G *3/00*

U.S. Cl. 248—297.3 **7 Claims**



1. Device in the form of a furniture fitting for guiding an equipment supporting plate in a generally vertical direction and locking it in at least two positions at different heights, in which one of the two parts, namely plate and column, moving relative to each other during vertical motion is provided with a pin and the other is provided with a grooved generally loop-shaped guideway having two branches, for admitting the end of the pin, the equipment carrying plate in at least one upper locking position being supported from below by the pin and the side portion of a guide surface, and means for preventing the pin from entering into at least one of the two grooved guideway branches from the undesired direction, characterized in that in the sections (**28, 35, 40, 29, 51, 52, 48**) of the grooved guideway steps are provided having steeply rising surfaces (**33, 38, 41, 43, 53**), that the pin end (**32**) moving in the grooved guideway is urged against the bottom of the groove by spring means (**21, 62**), and that the rising surfaces of the steps form stops for the pin end (**32**) in one direction of movement.

4,508,303

HOLDER FOR CONTAINERS

Frank S. Beckerer, Jr., 40 Dock Rd., Milford, Conn. 06460

Filed Apr. 10, 1980, Ser. No. 138,964

Int. Cl.³ A47K *1/08*

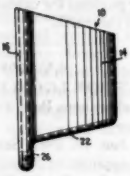
U.S. Cl. 248—311.2 **20 Claims**

1. A one-piece holder of resilient molded plastic substance for supporting a container on a supporting surface of a vehicle, boat, or pier, comprising in combination:

(a) an open-top vertical body having side walls adapted to encircle the container, and having means at the bottom, engageable with the container to support the same,

(b) said side walls including a mounting portion for engagement with and securement to said supporting surface,

(c) said side walls at one level constituting a continuous and unbroken cross section and at all levels having means enabling them to be radially expansible so as to accommodate containers of varying girths,



(d) said container support means comprising an expansive bottom wall disposed transverse to said side walls, and

(e) means providing a sump for collecting liquid resulting from rain water, splashes, or spillage onto the surface of said bottom wall,

(f) said sump being disposed adjacent to the mounting portion of said body wall.

4,508,304

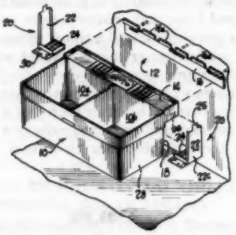
LAUNDRY TUB MOUNTING APPARATUS

Robert J. Mustee, Middleburg Heights, Ohio, assignor to E. L. Mustee & Sons, Inc., Cleveland, Ohio

Filed Feb. 28, 1983, Ser. No. 470,062

Int. Cl.³ A47K *1/04*

U.S. Cl. 248—311.2 **13 Claims**



1. A one-piece plastic side filler for a laundry tub, comprising:

(a) structure defining a cover portion and a load bearing portion interconnected by a line of weakness along which said filler is bent to position said cover and load bearing portions in an installed orientation;

(b) said cover portion defined by a substantially planar member that is sized to extend between a rear of the tub and a tub mounting surface;

(c) said cover portion including structure engageable with said tub to maintain said cover portion in its operative position;

(d) said load bearing portion including a plurality of reinforcing ribs extending between a lower portion of said tub and the tub mounting surface and operative to maintain a spatial relationship between said lower portion and said support surface;

(e) said cover portion including rigidizing structure for receiving and coacting with cooperating structure on said load bearing portion, said rigidizing structure receiving said cooperating structure when said cover and load bearing portions are bent into said installed orientation;

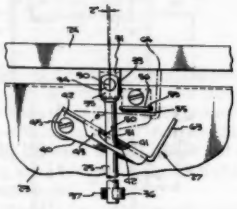
(f) said rigidizing structure comprising spaced recesses located near said line of weakness and said cooperating structure comprising corners of spaced abutment walls which enter said recesses when said side filler is bent.

4,508,305

TILT LOCK MEANS FOR A DRAFTING TABLE

Sigurd A. Johnson, Mission Viejo; Frank S. Avella, Irvine, and Robert I. Jones, Norco, all of Calif., assignors to Plan Hold Corporation, Irvine, Calif.

Filed May 6, 1983, Ser. No. 492,229
Int. Cl.³ A47F 5/12
U.S. Cl. 208—455 **16 Claims**



1. A tilt lock device for infinitely varying the inclination of a drawing board mounted about a hinge axis along one edge to a base structure between a maximum tilt angle and a minimum tilt angle comprising in combination:

a lock rod pivotally connected at one end to said drawing board and extending downwardly alongside said base structure

a lock member pivotally mounted on said base structure and having a plate portion lying in a plane transverse and inclined to the axis of said rod,

said plate portion haing a hole therein greater than the cross sectional area of said rod;

said hole having a configuration providing locking 50% contact with the rod surface in relative angular positions of the rod axis and the inclined plane of the plate portion;

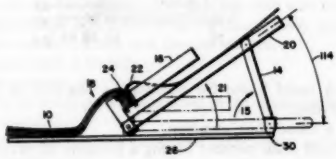
and cooperable means on said base structure and on said lock member to hold said pivotally mounted lock member in a position for free relative movement of said rod with respect to said lock member.

4,508,306

COMPUTER READ-OUT BOOK STAND

Kermit H. Kemmerer, Jr., R.D. #1, Box 1049, Stroudsburg, Pa. 18360

Filed Oct. 17, 1983, Ser. No. 542,745
Int. Cl.³ F16M 13/00
U.S. Cl. 248—454 **11 Claims**



1. A computer read-out stand comprising:

(a) a generally rectangular base having a proximal end, a distal end and longitudinally extended sides connecting said ends, said sides including triangular extensions to receive a book support;

(b) a generally rectangular adjustable book support having proximal and distal ends and longitudinal sides, said book support movably connected on its proximal end to said base's longitudinal sides proximate said sides' midpoints, said support including a bar attached at its ends, one each to each of said longitudinal sides and parallel to and approximate said proximal end;

(c) at least one U-shaped book support elevator, each of said elevators' legs being rotatably attached to said base's distal end by a bar across open end of largest of said elevators, said elevators' bights being adapted to removably fit in a retaining means;

(d) retaining means on said book support's distal end to receive and hold a bight of one of said elevators in position for use;

(e) a pair of L-shaped posts attached to said book support, said posts' upright arms extending parallel to said book support's longitudinal sides, and said L's short arms attached at their ends to said support end and side intersections, so that said L's short arms form extensions of said support edges to provide receiving means for book spine holders;

(f) at least one book spine holder adapted to slidably mount on said posts,

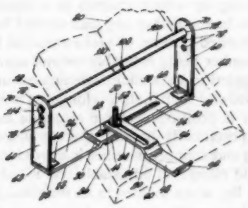
whereby, when said retaining means is engaged, said book spine holder may be inserted into a book spine, and said holder may be slidably overfitted onto said posts, thereby supporting said book at a predetermined angle.

4,508,307

FOLDABLE, SELF-SUPPORTING, ADJUSTABLE BOOK HOLDER

Liborio D. Morales, 815 Marilla St., Santa Barbara, Calif. 93101

Filed Jun. 22, 1984, Ser. No. 623,249
Int. Cl.³ A47B 97/04
U.S. Cl. 248—460 **7 Claims**



1. A foldable, self-supporting, adjustable book holder comprising:

a first base member having an elongated base section which extends a predetermined distance from a first end to a bend wherein the remaining portion of the elongated base section defines an elevated, substantially parallel elongated support section ending in a second end, said elongated support section having a length at least equal to said predetermined distance and having located along the axis thereof an elongated slot which extends from about the bend to about the second end of the elongated base section and which is adapted to slidably receive therein an elevated boss which is movable within and along said elongated slot;

a second base member having an elongated planar support member which extends between a first end and a second end a distance which is at least equal to said predetermined distance, said second end of said second base member having formed therein an elevated boss which is adapted to be positioned in and movable within said elongated slot to vary the distance between said first end of said first base member and the first end of said second base member, said second end further including means defining

the elongated fastening means which is located adjacent elongated boss and toward said second end of said second base member;

a pair of side members, one of each of which has one end thereof pivotally connected to said first end of said first base member and said first end of said second base member so as to be movable between an unfolded position, wherein said side members are positioned in a substantially parallel, spaced, opposed relationship to each other, into a folded position wherein each side member is rotated around this pivotal axis toward each other and toward said first base member and said second base member into a common plane with each other and which is substantially parallel to the plane defined by said first base member and said second base member, said side members each terminating at one end thereof opposite to said end which is pivotally connected to said first base member and said second base member, having at least one opening formed therein which extends therethrough which is in axial alignment with the opening formed in the opposite side member when the side members are positioned in the unfolded position;

an elongated, adjustable rod member which is adapted to be adjustable in length along its axial axis and adjustable a distance in excess of the greatest distance between said first end of said first base member and the first end of said second base member, said elongated adjustable rod member having a cross-sectional dimension such that the end thereof will pass through said opening in each of said side members and which has sufficient rigidity when passing therethrough to support a book; and

an elongated holding and support member having a first extended portion which has the elongated slot therein to cooperate with said fastening means to prevent said elongated holding and support means to be located at a substantially normal position relative to said first base member and said second base member, said elongated holding and support member having its other end formed into a protruding lip which extends in a direction away from said first base member and said second base member, said first extended portion of said elongated holding and support member being rotatable around said fastening means and adapted to have such fastening means slide within its elongated slot such that the elongated holding and support member is positioned above said side members and in a plane substantially parallel thereto when said elongated holding and support member is moved into a folded position, said elongated adjustable rod member and said protruding lip, when located in an unfolded position, providing a three-point support system which is adapted to receive and support a book at a selected reading angle which is determined by the relative position of the elongated, adjustable rod member within the opening as defined in said side members and the distance said protruding lip is located away from said first base member and said second base member.

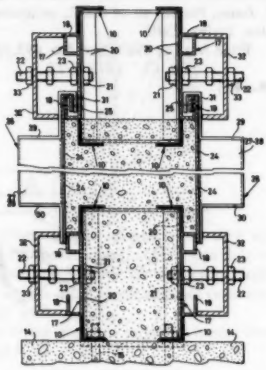
4,508,308

REINFORCEMENT STRUCTURE FOR REINFORCED-CONCRETE BUILDINGS

Ineo Rossin, Minerbe, and Francesco Zanella, Verona, both of Italy, assignors to Edilvelox S.R.L., Verona, Italy

Filed May 4, 1982, Ser. No. 374,794
Claims priority, application Italy, May 7, 1981, 21571 A/81
Int. Cl.³ E04G *11/02*
U.S. Cl. 249—19 **12 Claims**

1. A reinforcement structure for use in forming reinforced cast concrete buildings, said reinforcement structure comprising a servicing portion and a structural portion; said structural portion being in the form of reinforcing frames for cast concrete beams and columns with said frames being interconnectable to form a structural arrangement and being intended to remain in the cast concrete, each of said frames being formed of a plurality of elongated structural members and interconnecting members to form a rigid structural component; and said servicing portion including spacer elements and sidewall elements, and removable members for releasably directly latching said sidewall elements and said spacer elements to at least certain of said frames to form molds directly mounted on said frames for the casting of concrete in association with said frames, said spacer elements are each in the form of planar



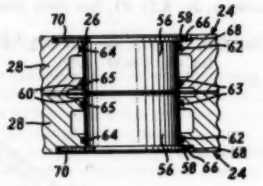
sections which on one side have at one end a projecting spacer portion and at the other end a projecting hook extension, the height of such planar sections being such as to permit the insertion thereof between two ones of said structural members of one of said frames with outer surfaces of the projecting portion and the hook portion being coplanar in a plane parallel to the plane of said planar section.

4,508,309

FAST THERMAL RESPONSE MOLD

Robert A. Brown, Mattapoisett, Mass., assignor to Acushnet Company, New Bedford, Mass.

Filed Jun. 14, 1982, Ser. No. 387,956
Int. Cl.³ B22D *27/04*
U.S. Cl. 249—81 **14 Claims**



1. A mold frame for receiving a plurality of half molds comprising:

(a) a frame plate member;

(b) said plate member having a plurality of cavities therein, each cavity for receiving a replaceable half mold, each said half mold when received in said cavity defining a space between itself and the walls of the cavity;

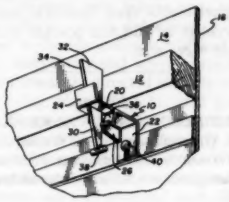
(c) said space surrounding said half mold; and

(d) means operative to provide serpentine fluid communication between the spaces surrounding said half molds in said cavities, said fluid directly contacting each of said half molds.

4,508,310
WALER BRACKET

Allan A. Schultz, Rte. 2, Box 79, New Richland, Minn. 56072

Continuation of Ser. No. 389,859, Jun. 18, 1982, abandoned.
This application Sep. 20, 1983, Ser. No. 534,123
Int. Cl.³ E04G 17/06
U.S. Cl. 249—189 1 Claim



1. In combination with a plurality of vertical panels arranged in a side-by-side edge abutting array, said panels interconnected by joining means mounted on studs projecting from the face of adjoining panels, a plurality of waler bracket clamps for securing a waler to the faces of said panels and aligning the faces of said panels into a common plane, each of said brackets comprising, in combination:

frame means having a first substantially vertical portion constructed and arranged to releasably engage at least one stud projecting from the face of one of said panels, and a substantially horizontal central portion constructed and arranged for supporting a waler and a second substantially vertical portion on the opposite side of said central portion from said first vertical portion, said central portion including a slot therein disposed from said first substantially vertical portion, said central portion of said frame means including a flanged means mounted below said slot for receiving a keeper bar attached to a wedge means while permitting said wedge means to be readily moved from said flanged means in a non-engaging movement to an operable position in which the wedge means engages the waler; and said wedge means having a narrow portion inserted into said slot for forcing the waler flush against the face of the panel thereby aligning the face of the panel with the edge of the waler, said keeper bar attached to said narrow portion of said wedge means transversely to said slot for retaining said wedge means in said slot.

4,508,311
ANNULAR BLOWOUT PREVENTER

Friedrich E. Just, and Bolie C. Williams, III, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Nov. 12, 1982, Ser. No. 441,056
Int. Cl.³ E21B 33/06
U.S. Cl. 251—1 B 4 Claims

1. An annular blowout preventer comprising

a body having a central bore therethrough with an annular packer recess surrounding and opening onto said bore

an annular packer positioned in said packer recess, and

means for axially loading said annular packer,

said annular packer including

a resilient annulus,

a plurality of insert plates embedded in the upper surface of said annulus,

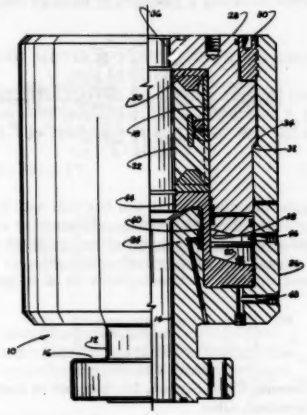
a plurality of insert plates embedded in the lower surface of said annulus,

a sleeve embedded in said annulus at a position spaced inward from the outer periphery thereof and having its upper end spaced from the underside of said upper insert plates and its lower end spaced substantially the same distance above the upper surface of the lower insert plates,

a first ring embedded in said annulus surrounding said sleeve at a position above its mid point,

a second ring embedded in said annulus surrounding said sleeve at a position below its mid point,

means coacting with said upper ring to move it upward with respect to said sleeve as said packer is compressed, and

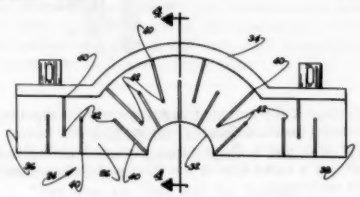


means coacting with said lower ring to move it downward with respect to said sleeve as said packer is compressed.

4,508,312
RAM-TYPE BLOWOUT PREVENTER

William M. Taylor, and Bolie C. Williams, III, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Jun. 8, 1983, Ser. No. 502,313
Int. Cl.³ E21B 33/06
U.S. Cl. 251—1 A 9 Claims



6. A ram packer for a ram-type blowout preventer comprising

an upper plate,

a lower plate, and

packing between the plates,

said plates having sufficient flexibility to flex about the axis of the housing bore when the rams are closed on a drill or pipe string and move into close proximity with a string therein while having sufficient transverse rigidity to prevent extrusion of said packing.

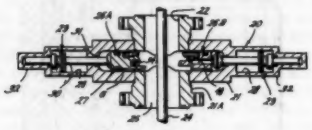
4,508,313
VALVES

Marvin R. Jones, Houston, Tex., assignor to Koomey Blowout Preventers, Inc., Brookshire, Tex.

Division of Ser. No. 446,390, Dec. 2, 1982,. This application Dec. 27, 1983, Ser. No. 565,766
Int. Cl.³ E21B 33/06
U.S. Cl. 251—1 A 2 Claims

1. A blowout preventer, comprising a housing having a bore therethrough and opposed guideways which intersect the bore, rams reciprocable within the guideways between bore

opening and closing positions, means for sealing between the inner ends of the rams and between each ram and its guideways when the rams are closed, means connecting the bore of the housing beneath the closed rams with chambers in the housing behind the closed rams so that fluid in the bore urges the rams closed, means including a passageway through only one ram



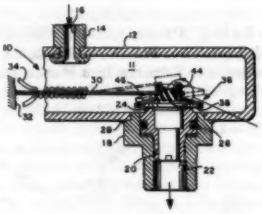
connecting the chamber behind said one ram with the bore of the housing above the closed rams, and means for reciprocating the rams between opened and closed positions including means for closing the passageway as the one ram is moved inwardly and opening the passageway as it is moved outwardly.

4,508,314

GAS VALVE

Wilbur F. Hemme, Carol Stream, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 18, 1984, Ser. No. 571,769
Int. Cl.[3] F16K *31/00*
U.S. Cl. 251—11 **5 Claims**



1. An electrically actuated valve assembly comprising:

(a) housing means defining a valving chamber having a fluid inlet port and a fluid outlet port and including means defining a valve seat in the flow path between said inlet and outlet port;

(b) a thermally responsive means mounted on said body means and disposed in said valving chamber and having an arm member having an end portion thereof disposed adjacent said valve seat and operative in response to electrically energized heating, to provide movement of said portion with respect to said valve seat; and,

(c) poppet means received through said portion of said member, said poppet means formed integrally of resilient elastomeric material and having,

(i) a flange portin disposed on one side of said arm member,

(ii) a neck portion extending from said flange and received through said arm member,

(iii) a valve head extending from said neck and disposed on a second side of said arm opposite said one side and having a valving face thereon for contacting said valve seat, to permit and prevent fluid flow thereover, said valve head having

supporting means including co-operating surface portions of said arm second side, and said poppet means said supporting means being disposed about said neck for providing at least one contact surface for said arm against said poppet means upon said arm being biased in a direction tending to urge said valving face into contact with said valve seat, said supporting means being spaced radially outwardly from said neck thereby providing a groove at the juncture of the supporting means and said neck,

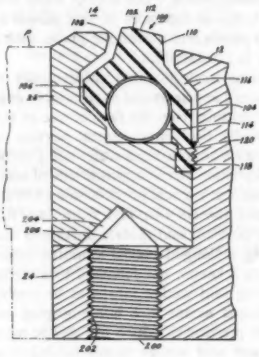
(iv) said neck portion configured to have the distance from said flange to said supporting means greater than the thickness of said arm portion from said one side of said second side, wherein said neck portion permits a predetermined amount of lost-motion movement on said poppet means upon electrical heating of said arm for movement of said arm portion in a direction away from said valve seat.

4,508,315

BIDIRECTIONAL VALVE SEAL

Carl F. Livorsi, Warwick; Joseph A. Wucik, Jr.; Philip J. Dorrian, both of Westerly, and Lawrence F. Struzik, Weekapaug, all of R.I., assignors to Edison International Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 267,956, May 28, 1981, abandoned.
This application Aug. 2, 1983, Ser. No. 519,617
Int. Cl.[3] F16K *25/00*
U.S. Cl. 251—173 **2 Claims**



1. A valve seal for a valve having an annular valve body which defines an axially extending valve chamber, a valve closure member which is movable in the valve chamber between open and closed positions, and an annular retaining ring which is secured to said valve body and which defines therewith an annular slot having a circumferential inwardly-facing axially-extending shoulder, the valve seal comprising:

an annular fluoroplastic valve seating member having a generally U-shaped cross-section defining generally radially outwardly extending first and second legs which are connected by a generally inwardly-facing axially-extending bight portion of circular cross-section, said bight portion including a radially disposed inwardly facing annular sealing surface for sealing cooperation with the valve closure member in the form of an interference fit;

anchor means, extending radially outward from said first leg, for flexibly and rotatably anchoring said seating member between the valve body and the retaining ring and in the annular slot, said seating member having an axial cross-section relative to the axial cross-section of the slot so as to divide the slot into first and second axial sides each in fluid pressure communication with the valve chamber, whereby said seating member is free to rotate about said anchor means relative to the axial limits of said slot, said legs and bight portion of said valve seating member defining an open annular generally circular circumferential groove which is bounded generally axially by said first and second legs and generally radially inwardly by said bight portion, said annular groove being open generally radially outwardly to the shoulder in the slot and in flow

communication with said first axial side of said valve chamber, whereby when said valve is closed fluid pressure on said first axial side in excess of the fluid pressure on said second axial side urges said sealing surface into engagement with said valve closure member; and

a plurality of generally circular spaced apart resilient elastically deformable elements which are connected together in the form of an open helix whose ends are connected together so as to form a circle and whose circumference is generally equal to the circumference of said groove such that it neither compresses said seating member inwardly nor applies an outwardly directed force to said shoulder, said elements being disposed within said groove in substantial radial alignment with said sealing surface, each of said resilient elements having a sufficiently large circumference so as to have peripheral sectors which simultaneously bear against said first leg and said second leg and said bight portion and said shouder, each of said resilient elements being formed from a coil of flat wire having a generally rectangular cross-section and being disposed within said groove with the longer side of said rectangular cross-section bearing against the interior surfaces of said groove,

whereby that sector of any one resilient element which bears against said bight portion of said seating member resists outward displacement of said seating member, urges said sealing surface against the closure member, when said valve is closed, and when displaced outwardly produces an expansive reaction force in adjacent resilent elements which is directed generally inwardly towards said seating member.

4,508,316

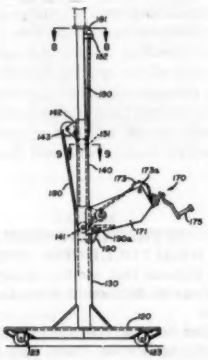
CABLE DRIVEN JACK

Ralph A. Millard, 119 W. Waterloo Rd., Akron, Ohio 44319

Continuation-in-part of Ser. No. 275,887, Jun. 22, 1981, abandoned. This application Apr. 25, 1983, Ser. No. 488,099

Int. Cl.³ B66F *7/02*

U.S. Cl. 254—4 R **5 Claims**



1. A jack, comprising:

(A) a base;

(B) a hollow upright member secured to and projecting from said base;

(C) a first support tube telescoped within said upright member;

(D) a second support tube telescoped within said first support tube;

(E) drive means carried by said upright and selectively engaging said first and second support tubes to move said tubes between retracted and extended positions with respect to said upright member at different speeds; and

(F) said drive means including

(1) a winch mounted on said upright member and

(2) a cable having one end secured to said winch; and

(3) attachment means carried by said first and second support tubes for releasably and selectively engaging the opposed end of said cable.

4,508,317

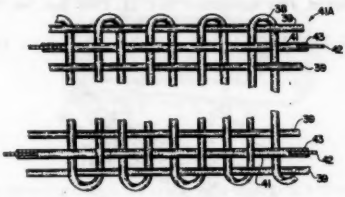
TAPE AND METHOD FOR MEASURING AND/OR PULLING CABLE

Allen C. Conti, 5294 E. 117th St., Garfield Heights, Ohio 44125

Continuation-in-part of Ser. No. 346,385, Feb. 5, 1982, abandoned. This application Aug. 5, 1982, Ser. No. 405,317

Int. Cl.³ H02G *1/08*

U.S. Cl. 254—134.3 FT **12 Claims**



5. A method for installing cable along a course of travel in a duct, said method comprising the steps of selecting a tape having a break strength in excess of 750 pounds of pull force and comprising between 20 and 50 parallel warp threads which essentially include filaments of aromatic polyamide fibers joined by a crossed interlocking weave of weft thread to hold the warp threads together in the form of a web having a weight of between 2.8 and 7 pounds per 1000 feet of said tape, said tape having an elongation of about 5% at least at said break strength to minimize stored kinetic energy in said tape for controlling tension on said cable during advancement along said duct for placement therein, pulling said tape along said course of travel in the duct essentially only by applying tension to the leading end of the tape, coupling an end of said tape to an end of said cable, and pulling said cable in said duct while controiling the tension imposed on said cable by said tape.

4,508,318

ELECTRIC HOIST

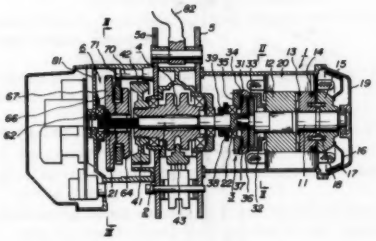
Kazuo Maeda, Yokohama, Japan, assignor to Kabushiki Kaisha Kito, Yamanashi, Japan

Filed Aug. 19, 1983, Ser. No. 524,634

Claims priority, application Japan, Aug. 25, 1982, 57-146211

Int. Cl.³ B66D *1/14;* **F16D** *7/00*

U.S. Cl. 254—350 **4 Claims**



1. An electric hoist including an electric motor, a driving shaft connected to a rotor shaft of said electric motor, a reduction gear train for transmitting rotation of said driving shaft to a load sheave, and a mechanical brake assembly in said reduction gear train, comprising an overload safety device arranged in a connection between said driving shaft and said rotor shaft

of said motor, said overload safety device comprising a casing fitted through a one-way clutch onto said rotor shaft, a first support member fixed to said rotor shaft, a second support member slidably fitted on said driving shaft, a retainer member fixed to said casing, friction plates respectively arranged between said first and second support members and between said second support member and said retainer member, and urging means for urging said retainer member toward said first support member.

4,508,319

BENDER BOARD MOUNTING SYSTEM

R. Warner Tappan, and Pam R. Tappan, both of 27265 Calle Anejo, Capistrano Beach, Calif. 97624

Continuation-in-part of Ser. No. 470,966, Mar. 1, 1983, abandoned. This application Nov. 21, 1983, Ser. No. 553,588
Int. Cl.³ E04H 17/14
U.S. Cl. 256—19 **12 Claims**

1. In a device for holding boards or the like in generally fixed relation to the ground, the combination comprising:

(a) a stake member configured for insertion into the ground, said stake member including slot means adjacent one end thereof; and

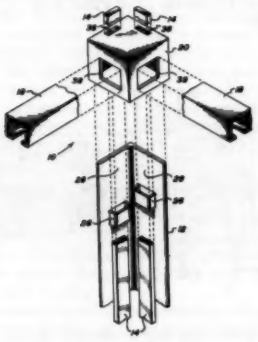
(b) a generally U-shaped channel member having a bight portion configured for attachment to said stake member and a pair of generally resilient, generally vertical leg portions for receiving and holding a board or the like therebetween, the bight portion of said channel member being slotted for engagement with said slot means for separably interconnecting the two parts.

4,508,320

FENCE SYSTEM

Bernard L. Hegarty, 3746 Oakland Rd., Bethlehem, Pa. 18017

Filed Nov. 19, 1981, Ser. No. 323,088
Int. Cl.³ B21F 27/00
U.S. Cl. 256—47 **7 Claims**



1. A fence system comprising:

(a) A sheet metal angle bar suitable as a gate or terminal post, said post including a generally right angle bend to form two faces, said post further including horizontally disposed staples spaced linearly along the longitudinal axis of at least one of said faces, said staples adapted to receive a slide-in tension bar;

(b) a rigid tension bar of generally the same longitudinal length as said post, said tension bar having a shape in cross section adapted to allow the bar to simultaneously slide into and be retained by said post staples, and to slide into and retain a fence wire mesh, whereby said mesh is connected to said post; and,

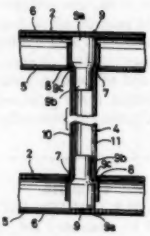
(c) a post cap adapted to overfit said post end and said cap top is slotted to receive said tension bar(s) end, and further including at least one aperture to receive a top rail.

4,508,321

LATTICED TUBULAR FENCE AND METHOD OF MAKING SAME

Tsuyoshi Morimoto, Osaka, Japan, assignor to Totoku Co., Ltd., Osaka, Japan

Filed Feb. 2, 1983, Ser. No. 463,284
Int. Cl.³ E04H 17/14
U.S. Cl. 256—65 **3 Claims**



1. A tubular fence comprising a horizontal tube comprising a clad tube having an inner iron tube and an outer overlying stainless layer, said horizontal tube having a lateral opening of predetermined diameter in said iron tube, a flange of said outer stainless layer extending inward through said opening and covering the edge of the opening in the iron tube, a vertical tube extending through said flange in contacting relation therewith into said horizontal tube, and an expanding pin press fitted in the end of said vertical tube and expanding the end thereof into said contacting relation with said flange.

4,508,322

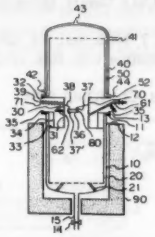
APPARATUS FOR PREPARING HIGH MELTING POINT HIGH TOUGHNESS METALS

Etsuji Kimura; Katsumi Ogi, and Kazusuke Sato, all of Saitama, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 580,743
Claims priority, application Japan, Apr. 27, 1983, 58-072926
Int. Cl.³ F27B 5/04
U.S. Cl. 266—149 **10 Claims**

1. In a hermetically closable and evacuable apparatus for preparing high melting point high toughness metals by reduction of a chloride of said metals comprising a heatable reaction chamber and a coolable condensation chamber provided above the reaction chamber and communicating with the condensation chamber through an intermediate connecting section, the improved apparatus characterized in that said intermediate connecting section is provided with a seal pot closing means comprising an upright funnel body which has an opening of a substantial size and is supported by the internal wall of the intermediate connecting section at its periphery; a pan which can receive a fusible material therein and is pivotable around a

rotation shaft secured thereto at one end thereof between a receiving position and a pouring position and receives the



lower pipe of the funnel body when it is at the receiving position; and a heating means for heating the seal pot.

4,508,323

RUNNER FOR MOLTEN METAL

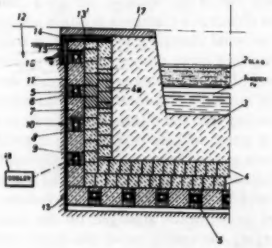
Georges Fleming, Esch, Luxembourg, assignor to ARBED S.A., Luxembourg, Luxembourg

Filed Mar. 23, 1983, Ser. No. 478,064

Claims priority, application Luxembourg, Mar. 26, 1982, 84042

Int. Cl.³ C21B *7/14*

U.S. Cl. 266—191 **7 Claims**



1. A runner for conducting molten metal from a furnace, the runner comprising:

a support trough;

a trough-shaped temperature-equalizing layer received in and lining the trough;

means for circulating a liquid coolant through the equalizing layer for cooling the layer to a uniform temperature of about 100° C.;

a permanent refractory outer lining of bricks received in and lining the layer; and

a renewable packed refractory inner lining received in and lining the outer lining for directly contacting molten metal when the latter is in the runner, the temperature-equalizing layer being more thermally conductive than the linings, said means for cooling the layer including conduits in heat-conducting engagement with the layer and means for circulating a coolant through the conduits, said layer having a coefficient of thermal conductivity greater than 10Kcal/m·°C.·h and being composed of at least one material selected from the group which consists of silicon carbide, semigraphite or graphite.

4,508,324

FASTENING MEANS FOR A CLOSURE PLATE ON A SLIDING SHUTTER OUTLET IN A VESSEL WHICH CONTAINS MOLTEN METAL

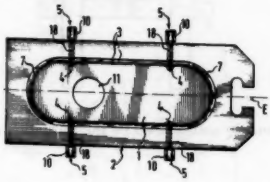
Ernst Lührsen, Bad Schwalbach; Siegfried Pohl, Wiesbaden-Medenbach, and Jürgen Plath, Wiesbaden, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 502,948

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1982, 3223181

Int. Cl.³ B22D *41/08*

U.S. Cl. 266—236 **27 Claims**



1. A securing device for removably mounting a closure plate to a supporting frame member, said closure plate being adaptable for receiving valving means of said supporting frame member when said closure plate is mounted on a vessel for containing molten metal, said securing means comprising in combination:

a closure plate with a removable band-like metal sheath adapted to completely encircle at least the periphery around the edge thereof;

said sheathed closure plate being adapted to be removably received and retained in said supporting frame member;

adjustable tightening and securing means for tightening said metal sheath to grip said closure plate and for fastening said closure plate within said supporting frame wherein said closure plate includes at least one recess in its periphery, and said tightening and securing means comprises an adjustable fastening member supported by said frame member and having at least one end section which, in assembly, tends to extend into said at least one recess by deforming and forcing a portion said band-like sheath adjacent said at least one recess into said at least one recess thereby removably securing said sheath about the entire periphery of said closure plate.

4,508,325

COMPOSITE LEAF SPRINGS

Barry J. Marsh, Penkridge, England, assignor to GKN Technology Limited, England

Filed Apr. 4, 1983, Ser. No. 481,807

Claims priority, application United Kingdom, Apr. 21, 1982, 8211553; Sep. 14, 1982, 8226139

Int. Cl.³ F16F *1/26*

U.S. Cl. 267—47 **13 Claims**

1. An assembly comprising:

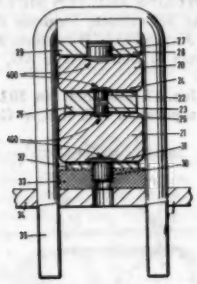
a leaf spring of composite material comprising fibres embedded in a resin,

a clamping means engaging said spring and also engaging a first member to secure said member to the spring,

a locating element having a head portion and a body portion, said head portion extending into a depression defined in a surface of said spring and said body portion engaging said member to determine the position of said member relative to said spring,

said depression being shallow relative to the thickness of the spring, having sloping walls and having been formed in

the spring during manufacture thereof in a moulding process whereby fibres adjacent said depression remain



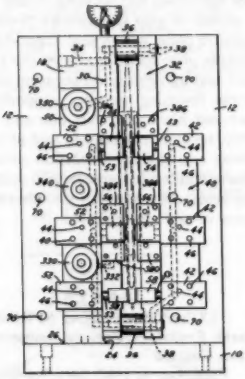
substantially undisplaced by the formation of said depression.

4,508,326

PRESSURE CHUCK FOR IRREGULAR ARTICLES

Eugene R. Andre, 26405 Hendrie, Huntington Woods, Mich. 48070

Filed Jan. 11, 1983, Ser. No. 457,154
Int. Cl.³ B23K *19/00*; B25B *1/24*
U.S. Cl. 269—22 **7 Claims**



1. A workpiece holder for securing a workpiece in a predetermined location to prevent movement or vibration during a metal removing operation which comprises:

(a) means forming a recess to receive the workpiece,

(b) initial fixed locator members to orient the workpiece in the said recess, and

(c) a plurality of spaced pressure discs adjacent said recess operable to contact and secure the workpiece in said recess upon pressure actuation of said discs,

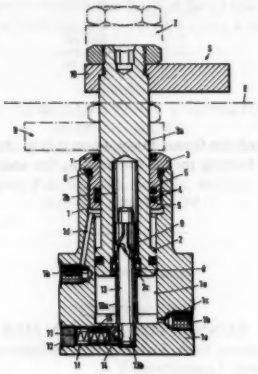
(d) said means forming said workpiece recess comprising a base, spaced parallel plates mounted on said base, rod means securing said plates in spaced relation, hydraulic pressure developing means in one of said plates, and means forming pressure passages in said plates and said rods to conduct fluid pressure to said spaced pressure discs.

4,508,327

SWING CLAMP

Metin Ersoy, Hilchenbach, Fed. Rep. of Germany, assignor to Maschinenfabrik HILMA GmbH, Hilchenbach, Fed. Rep. of Germany

Filed Jan. 7, 1983, Ser. No. 456,477
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1982, 3201013
Int. Cl.³ B23Q *3/08*
U.S. Cl. 269—23 **14 Claims**



14. In a hydraulically actuatable swing clamp, particularly for the clamping of objects such as workpieces, tools and fixtures on a machine, having a single piston which is arranged in a housing, the piston having a piston rod which extends in sealed manner out of the housing, carries a clamping arm for clamping the object at a clamping position and carrying out, in addition to an axial clamping movement, a rotary movement corresponding to a guide device, the rotary movement effecting a swinging of the clamping arm, the guide device including a control bolt normally non-rotatable with respect to the housing and extending into the piston, and at least one cam groove provided in a guide surface between the control bolt and the piston, the cam groove having a helical section for the swinging and simultaneous stroke movement of the clamping arm and an axial section for pure clamping movement of the clamping arm, and guide means arranged on the piston or control bolt for engaging the cam groove, the improvement wherein

said cam groove constitutes means for swinging said clamping arm to and from an intermediate position above a clamping plane, said intermediate position being rotated by a predetermined angle relative to said clamping position, and to and from a rest position below said clamping plane, said rest position being rotated relative to said clamping position by a second angle.

4,508,328

VICE FOR FISHHOOK

Satoru Kojima, Nagano, Japan, assignor to Coret & Company, Ltd. and Machine Engineering Co., Ltd., both of, Japan

Filed May 10, 1984, Ser. No. 608,822
Int. Cl.³ B25B *1/08*
U.S. Cl. 269—236 **5 Claims**

1. A vice for a fishhook comprising:

a cam;

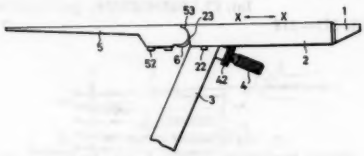
a main body;

a pair of jaws defining chuck means at front ends thereof, each jaw having a tapered portion, said jaws being positioned opposite one another to form a space therebetween at rear ends thereof, said space having said cam and a portion of said main body received therein;

a shaft at an axis of rotation of said cam passing through said jaws and said cam;

an operating lever integral with said cam, said cam and said lever being rotatable around said shaft;

an adjusting screw threadedly engaged with said main body and having a forward end in abutment with said cam;



a spring provided between said pair of jaws and said main body for urging said adjusting screw into abutment with said cam;

cam means integral with said main body for varying a distance between abutting tapered surfaces of said chuck means; and

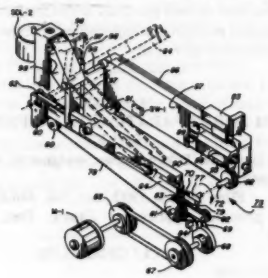
a cover for encasing at least said cam means and portions of said pair of jaws.

4,508,329

HIGH SPEED DUPLICATOR WITH STAPLER AND STAPLE LOADING ARRANGEMENT

Lawrence C. Hubler, Fairport; Joseph J. Ferrara, Webster; Roger N. Albright, Fairport, and Raymond C. Bassett, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1983, Ser. No. 563,735
Int. Cl.³ B42B *1/02*
U.S. Cl. 270—53 **4 Claims**



1. In a stapling apparatus having a clamping/stapling position whereat a plurality of sheets to be stapled are clamped preparatory to the application of a staple thereat, a magazine for holding one or more sticks of staples, and a staple follower within the magazine for contacting the end of a stick, the improvement comprising:

drive means engageable with the follower and adapted when in its release mode to provide a force thereon in a direction to force the staples toward the clamping/stapling position,

means for retracting the follower out of the magazine for permitting loading thereof with sticks of staples,

said means for retracting the follower being operatively connected to said drive means for conditioning the same to its release mode, and

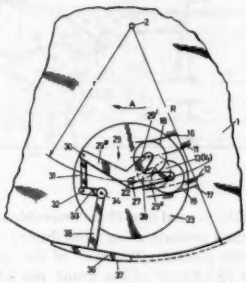
means for selectively controlling said drive means between its non-release mode and its release mode.

4,508,330

PICK-UP AND TRANSFER MECHANISM FOR LABELS OR THE LIKE

Norbert Jörss, Neutraubling, Fed. Rep. of Germany, assignor to Pirzer Co., Neutraubling, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 470,340
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, 3206704
Int. Cl.³ B65C *9/12, 9/16*
U.S. Cl. 271—33 **19 Claims**



1. A pick-up and transfer mechanism for labels or the like, comprising,

an intermediate carrier,

at least one pick-up element mounted on the carrier for pivotal movement about a first axis,

a carrying element,

the intermediate carrier being mounted on the carrying element for rotation about a second axis which is offset relative to the first axis,

frame means, said carrying element being mounted on the frame means for rotation about a third axis offset from said first and second axes,

at least one first guiding means mounted on the intermediate carrier,

first control cam means disposed on the frame means and engaged by the one first guiding means whereby said intermediate carrier will be rotated about said second axis in a predetermined manner as said carrying element rotates to move the one first guiding means on the first control cam means,

a lever means pivotally mounted on the intermediate carrier and about the second axis,

at least one second guiding means disposed on the lever means,

a second control cam means disposed on the frame means and engageable by the second guiding means,

linkage means for coupling the lever means to the pick-up element whereby the pick-up element will be pivoted in a predetermined manner as said carrying element is rotated to move the first and second guiding means on said first and second control cam means, respectively.

4,508,331

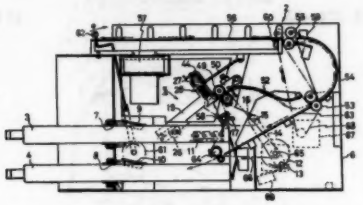
SHEET FEEDER

Atumi Kashiwagi, Osaka, Japan, assignor to Fujimoto Photo Industrial Co., Ltd., Osaka, Japan

Filed Mar. 2, 1983, Ser. No. 471,262
Int. Cl.³ B65H *3/08*
U.S. Cl. 271—107 **11 Claims**

1. A sheet feeder for forwardly dispensing stacked rectangular sheets one by one from the uppermost position comprising a connecting rod **14** having one end connected to a crank pin **13** revolvable in one direction; an intermediate arm **16** having a front end pivoted to the other end of the rod **14** and an intermediate portion supported by a pivot **17** on a fixed frame,

the arm **16** being pivotally movable upward and downward; a pivotal arm **19** having a front end coupled to the rear end of the arm **16** by a front connection **21** provided by a pin **20** and a slit **18** and a rear end positioned to the rear of the front end of the stack of sheets **11** and below the front connection **21** and coupled to the fixed frame by a rear connection **26** provided by a pin **25** and a slit **24**; and sheet attracting means **28** disposed at



the front end of the pivotal arm **19** and movable about the pivot **17** when in a raised position away from the top of the stack of sheets **11**, by the pivotal movement of the pivotal arm **19** effected by the revolution of the crank pin **13** through the connecting rod **14** and the intermediate arm **16**, the sheet attracting means **28** being movable about the pin **25** of the rear connection **26** when in a lowered position close to the top of the stack of sheets **11**.

4,508,332

SHEET FEEDER FOR COPYING MACHINES

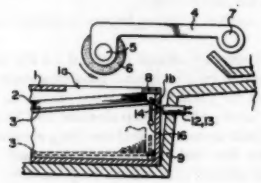
Tadashi Nishio, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Nov. 9, 1982, Ser. No. 440,290

Claims priority, application Japan, Dec. 5, 1981, 56-195120

Int. Cl.[3] **B65H** *3/06*

U.S. Cl. 271—118 **33 Claims**



1. A sheet feeder including a cassette having a bottom plate which has one end urged to move upward and adapted to receive a stack of sheets thereon, and a feed roller responsive to a feed signal to rock into its operative position where it contacts an uppermost one of the sheets in the stack within the cassette to feed the sheets, one by one, out of the cassette; characterized by:

means for detecting the height of said stack of sheets and for generating an output signal as a function thereof; and

means responsive to said output signal for varying the instant at which the feed signal is produced as a function of the height of the sheets in the stack.

4,508,333

SHEET STACKING APPARATUS

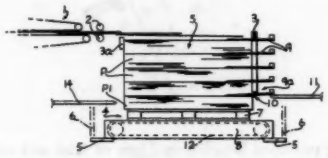
Graham A. B. Byrt, Thrissell Works, Easton Rd., Bristol BS5 0HE, England

Continuation of Ser. No. 237,162, Feb. 13, 1981,. This application Sep. 29, 1982, Ser. No. 426,521

Claims priority, application United Kingdom, Jun. 13, 1979, 7920581; Jun. 13, 1980, PCT/GB80/102

Int. Cl.[3] **B65H** *29/34*

U.S. Cl. 271—218 **7 Claims**



1. A method of feeding sheets to form a stack having a plurality of uniform portions each portion staggered with respect to adjacent portion comprising the steps of;

a. continuously feeding sheets generally horizontally in succession to a location wherein they are arrested and form a first portion of a stack with aligned edges,

b. continuing the feeding of sheets to form a second portion above the first portion while displacing the first portion vertically so that it is separated from the second portion,

c. moving the first portion after it has been displaced, then recombining the first and second portions so that the first portion is staggered with respect to the second portion,

d. continuing the feeding of sheets to form a third portion above the second portion while displacing the first and second portions vertically so that they are separated from the third portion, moving the first and second portions as a unit after they have been displaced, then recombining the first and second portions with the third portion so that the second portion is staggered with respect to each of the first and third portions.

4,508,334

SYSTEM FOR SEPARATING TRANSFER-PRINTING SHEET

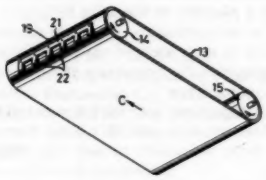
Yoshiharu Iwanaga, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Dec. 3, 1982, Ser. No. 446,679

Claims priority, application Japan, Dec. 7, 1981, 56-182384[U]

Int. Cl.[3] **G03G** *15/00*

U.S. Cl. 271—308 **3 Claims**



1. In a copying apparatus comprising a photosensitive member in the form of a endless belt trained over a plurality of rollers for movement along a predetermined path for forming an image on a surface of said belt on which a transfer-printing sheet is superposed to print the image thereon, a system for separating the transfer-printing sheet from the photosensitive

member and ejecting same from the copying apparatus following a transfer-printing operation, comprising:

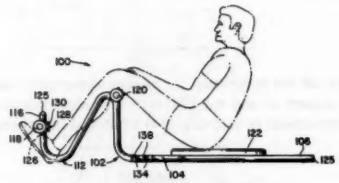
separating means mounted on the surface of said photosensitive member in the form of an endless belt in a receiving position in which the separating means lies flush with said belt, said separating means having a free end which lies beneath a leading edge of the transfer-printing sheet in said receiving position.

4,508,335

SIT-UP EXERCISER

Robert C. Kelley, and Ira J. Silberman, both of Opelika, Ala., assignors to Diversified Products Corporation, Opelika, Ala.

Filed Feb. 9, 1983, Ser. No. 465,151
Int. Cl.³ A01B *23/02*
U.S. Cl. 272—145 **13 Claims**



1. A sit-up exerciser comprising:

a frame having a generally flat, horizontal, bifuricated floor-engaging rear frame portion with two rearwardly extending side members which are contiguous with the floor over substantially their entire length, the front ends of said side members converging at the front of said rear frame portion, and a longitudinally extending front frame portion with a central longitudinal member having an upturned front end and a rear end which is joined to the converging front ends of said side members;

a low horizontal seat adjacent the floor attached to said rear frame portion substantially at the level of said side members; and

ankle-engaging means attached to said upturned front end of said front frame portion at an elevated position above the floor for engaging the tops of a user's ankles.

4,508,336

GAME DEVICE

Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Filed Dec. 22, 1983, Ser. No. 565,012
Claims priority, application Japan, Dec. 31, 1982, 57-201863
Int. Cl.³ A63F *7/02, 7/30*
U.S. Cl. 273—1 L **2 Claims**

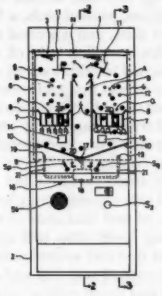
1. A game device including a water tank which contains balls having a specific gravity of slightly larger than that of the liquid in the water tank, said game device being characterized in that it is provided with:

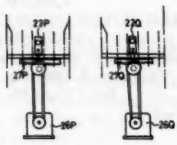
a rising passage at the central part of the water tank and a pair of descending passages on both sides of the rising passage by a vertical partition wall;

a rising water current generator below the rising passage;

a scoring zone comprising a plurality of scoring passages for each of the pair of descending passages;

a pair of ball passing detecting devices to determine an effective scoring passage among a plurality of scoring passages and a pair of control means for controlling the





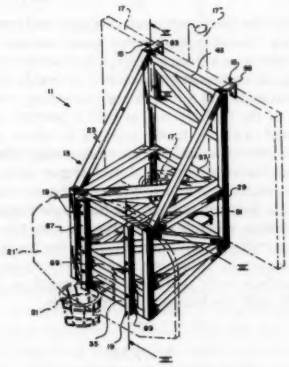
movement of the ball passing detecting device to make the effective scoring passage changeable.

4,508,337

BASKETBALL GOAL HEIGHT REDUCING FRAME

C. Earl Gillespie, Jr., 2114 Rock Ridge, Memphis, Tenn. 38134

Filed Mar. 23, 1984, Ser. No. 592,561
Int. Cl.³ A63B *63/08*
U.S. Cl. 273—1.5 R **4 Claims**



1. A basketball goal height reducing frame for securing an auxiliary basketball goal/backboard assembly at a lower height with respect to a primary basketball goal/backboard assembly, said frame comprising:

(a) support means for being securely attached to the backside of the backboard of the auxiliary basketball goal/backboard assembly;

(b) hanger means for being securely attached to the backboard of the primary basketball goal/backboard assembly; and

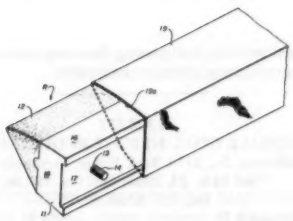
(c) linkage means for linking said support means and said hanger means with said support means located beneath said hanger means; said linkage means including a first side truss having first and second ends, a second side truss having first and second ends, a first end truss having first and second sides, and a second end truss having first and second sides; said first side of said first end truss being rigidly attached to said first end of said first side truss; said second side of said first end truss being rigidly attached to said first end of said second side truss; said first side of said second end truss being rigidly attached to said second end of said first side truss; said second side of said second end truss being rigidly attached to said second end of said second side truss; said first and second ends of said first and second side trusses having lower and upper ends; said upper ends of said first ends of said first and second side trusses being lower than said upper ends of said second ends of said first and second side trusses; said lower ends of said first ends of said first and second side trusses being lower than said lower ends of said second ends of said first and second side trusses.

4,508,338

BUMPER RAIL COVER AND METHOD OF INSTALLING THE SAME

Jacob Kremski, 10440 S. State Rd., Goodrich, Mich. 48438

Filed Dec. 1, 1980, Ser. No. 211,755
Int. Cl.³ A63D *15/06*
U.S. Cl. 273—9 **2 Claims**



1. A cover for the bumper rail of a pool table or the like, the bumper rail having a contoured outer surface including a resilient cushion on a front surface, a rear surface and end walls comprising, in combination, a sleeve of textile sheet material having open ends and a length corresponding substantially to the length of the bumper rail, at least a portion of said sleeve being formed of elastic textile material to allow said sleeve to be diametrically expanded for accommodating the bumper rail therein and for contraction of said sleeve into an installed position in overlying, tight-fitting engagement with the outer surface of the bumper rail and elastically deformable with the resilient cushion, wherein said sleeve has a length defining end portions extending outwardly beyond the bumper rail end walls and means for attaching said sleeve end portions to the rail rear surface with said sleeve end portions in overlying relationship with the bumper rail end walls.

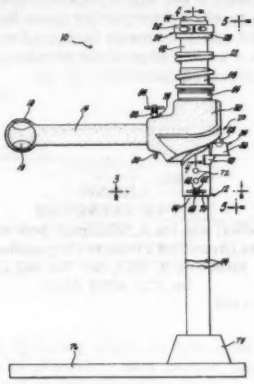
4,508,339

EYE-HAND COORDINATOR

Link W. Llewellyn, Flint, Mich., assignor to Chi Rho Corporation, Flint, Mich.

Filed May 30, 1984, Ser. No. 615,165
Int. Cl.³ A63B *69/40*
U.S. Cl. 273—26 E **13 Claims**

1. An eye-hand coordinator assembly (10) comprising; support means (12) having a longitudinal axis, a ball-supporting arm (14) having a ball (16) disposed at a distal end (18) thereof, cam means (20) operatively supporting said ball-supporting arm (14) on said support means (12) for allowing said arm (14) and said ball (16) to be displaceable from an initial rest position angularly about said longitudinal axis in response to an impact of said ball (16) while axially shifting along said longitudinal axis, said assembly characterized by energy dissipation means



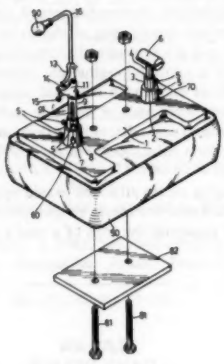
(20, 22, 24) for dissipating the energy imparted to said arm (14) upon impact of said ball (16) after a predetermined amount of free movement of said arm (14) from said initial rest position.

4,508,340

BATTING AID WITH PIVOTALLY SUPPORTED BALL

Leon Liao, No. 85-3, Yu Min St., Changhwa City, Taiwan

Filed Jul. 11, 1984, Ser. No. 629,589
Int. Cl.³ A63B *69/40*
U.S. Cl. 273—26 E **3 Claims**



1. A batting aid comprising:
a base member;
a main support member including
a collar fastened on said base member,
a tubular member disposed within said collar and fixed thereto by two set screws,
a rod member disposed within said tubular member and fixed thereto by two set screws,
a seat member provided on the top of said rod member, said seat member having a slot therein,
an eccentric disc pivotally mounted in said slot, and
an elongated rod extending from the top of said eccentric disc, said elongated rod having threaded portion at its free end;
ball fixing means threadedly engaged with said elongated rod and secured thereto by a nut, said ball fixing means

having a housing, a threaded portion provided at the end thereof and a fixing plate formed integrally with the housing in a way such that an annular space is formed between the fixing plate and the housing,

a ball member attached to said fixing plate of said ball fixing means in a manner that a part of said ball member is within the annular space; and

an auxiliary support member including

a sleeve fastened on said base member,

a tubular member disposed within said sleeve,

a rod disposed within said tubular member, and

a resilient rubber member secured on the top of said rod.

4,508,341

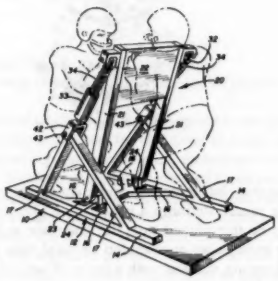
PASS-BLOCKING SLED

Michael R. Carrington, 2943 S. Parnell, Chicago, Ill. 60616

Filed Sep. 28, 1982, Ser. No. 425,633

Int. Cl.³ A63B *67/00*

U.S. Cl. 273—55 R **7 Claims**



1. A football pass block training sled comprising, in combination, stationary frame means, pivotally mounted arm means carried by said frame means for rotating motion in the vertical direction, means on said arm means positioned for engagement with the body of a player while practicing pass blocking said arm means being constrained for rotation about 30 degrees from either side of a 90 degree overcenter position, and resilient means for resisting movement by a person of said arm means from a static position on the first side of the overcenter position toward the 90 degree overcenter position and controllably thereafter moving the arm to a static position on the second side of the overcenter position and for also resisting movement by a person of said arm means from a static position on the second side of the overcenter position toward the 90 degree overcenter position and controllably thereafter moving the arm to a static position on the first side of the overcenter position.

4,508,342

GOLF PUTTER

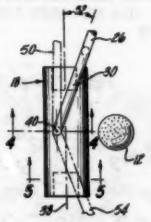
Robert C. Drake, 37971 Huron Point Dr., Mt. Clemens, Mich. 48043

Filed Mar. 28, 1983, Ser. No. 479,564

Int. Cl.³ A63B *53/02, 53/14*

U.S. Cl. 273—80 C **16 Claims**

1. A putter golf club comprising a head constructed and arranged so that when oriented to hit a golf ball such head is elongated generally horizontally and the longitudinal axis of such head extends generally horizontally, a front face on said head for striking a golf ball, said front face extending substantially parallel to said longitudinal axis, a shaft having an elongate shank portion, an elongate offset portion extending generally transversely of and fixed to such shank portion adjacent the lower end of such shank portion, and a depending portion fixed to and extending from said offset portion at a point remote from the connection of said offset portion of said shank, said depending portion being generally transverse to the longitudinal axis and connected to said head at the top of said head at a point on said head intermediate the longitudinally elongate extent of said head, said head being fixed to said depending



portion, and said elongate offset portion being inclined toward said front face at an acute included angle to said longitudinal axis of said head in the range of 10° to 30°.

4,508,343

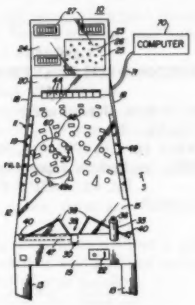
PINBALL GAME WITH RANDOMLY OPERABLE DROP TARGETS

Albin Peters, Chicago, and Zeilik Fainzilberg, Lincolnwood, both of Ill., assignors to Wico Corporation, Niles, Ill.

Filed Oct. 22, 1982, Ser. No. 435,978

Int. Cl.³ A63F *7/00*

U.S. Cl. 273—119 A **8 Claims**



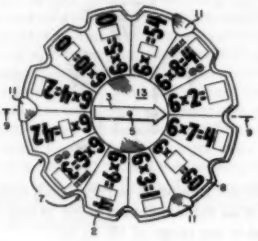
1. In a pinball game including a playfield board and one or more pinballs, the improvement comprising: means for propelling a pinball into rolling engagement with the playfield board along a variable propulsion axis, said propelling means including socket means for receiving a pinball in a set position from which it is propelled; a plurality of target assemblies mounted on said playfield board, each of said target assemblies including a single target member movable between a playing condition disposed for engagement by a pinball rolling along the playfield board and a retracted condition disposed out of the path of pinballs rolling along the playfield board, means responsive to engagement of said target member by a rolling pinball when said target member is in its playing condition for moving said target member to the retracted condition thereof, and drive means for effecting movement of said target member to the playing condition thereof independently of the target members of the others of said target assemblies; control means coupled to each of said drive means for controlling the operation thereof independently of one another automatically to control the sequence in which said target members are moved to the playing conditions thereof; guide means for returning a pinball from the playfield board to said socket means; and means for manually varying the direction of said propulsion axis.

4,508,344

SPINNER DEVICE

Kris K. Krogh, 6518 Madrid Rd. #7, Santa Barbara, Calif. 93117

Filed May 12, 1983, Ser. No. 494,063
Int. Cl.³ A63B 71/06
U.S. Cl. 273—141 R **12 Claims**



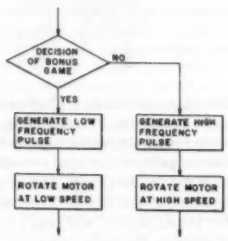
1. A spinner comprising a base, an upper section mounted pivotally on the base by means of a central member which protrudes through a hole in the base, a pointer mounted revolvably on the upper section by means of a fastener seated in the central member, and a set of interchangeable indicia-bearing cards having holes in their centers large enough to accomodate the spinner's pointer and having a symmetric shape which is capable of mating with raised areas on the upper section when placed on the upper section in a multiplicity of orientations, thus holding the cards in place with respect to the upper section.

4,508,345

SLOT MACHINE WITH PLAYER-FRIENDLY BONUS GAME

Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Apr. 20, 1983, Ser. No. 488,533
Claims priority, application Japan, Apr. 26, 1982, 57-68641
Int. Cl.³ A63F 5/04
U.S. Cl. 273—143 R **2 Claims**



1. In a slot machine having a plurality of rotatable reels arranged in side-by-side relationship, a plurality of stop switches associated with each of said reels for causing said reels individually to stop, each reel having an annular series of symbols on the peripheral surface thereof, and motors one individual to each said reel for rotating said reels; the improvement comprising means for the detection of the occurrence of a predetermined symbol or combination of symbols on said reels in the stopped position of said reels in the course of an original game and for emitting a bonus game signal responsive to a said detection to entitle a player to a bonus game immediately following said original game, motor control circuits driving said motors at high speed in a said original game, and means responsive to a said bonus game signal automatically to cause said motor control circuits to drive said motors at low speed in a said bonus game.

4,508,346

RANDOM NUMBER SELECTION METHOD AND APPARATUS

Lucio P. Salvucci, 746 Commercial St., Weymouth, Mass. 02189

Continuation-in-part of Ser. No. 369,418, Apr. 19, 1982, abandoned, and a continuation-in-part of Ser. No. 462,426, Jan. 31, 1983, abandoned. This application Jan. 23, 1984, Ser. No. 573,024
Int. Cl.³ A63F 9/00
U.S. Cl. 273—144 B **5 Claims**

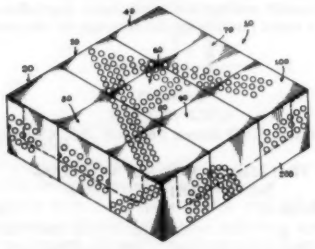
1. Apparatus for selecting and displaying random indicia comprising means defining a chamber, a plurality of elements adapted to be introduced into the chamber and each bearing one of the indicia, an open-ended vertical tube slightly larger than the elements, formed with a series of spaced apart perforations through its wall and in communication with the upper end of the chamber, means in communication with the lower end of the chamber for causing air to impinge upon the elements and entrain them into the tube, and releasable means for retaining at least one of the elements in the tube.

4,508,347

ALPHABET BLOCKS

Carol A. Saettler, 11977 E. Yale Ave., Aurora, Colo. 80014

Filed Aug. 24, 1983, Ser. No. 525,918
Int. Cl.³ A63F 9/12
U.S. Cl. 273—157 R **30 Claims**



1. An educational puzzle comprising nine individual blocks, adapted to be arranged into a grid pattern of three blocks down and three blocks across, and each individual block having six faces, wherein at least five of the six faces of each block are provided with indicia, that may be selectively arranged in the grid pattern, to form all twenty-six of the individual letters of the alphabet, on the combined top surfaces of the nine blocks; wherein each individual letter as represented by the upwardly

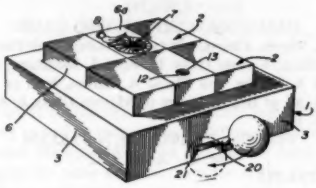
turned faces of the nine blocks is devoid of portions of any other letter outside of the contiguous form of the letter being represented.

4,508,348

ANIMATED PUZZLE BLOCK GAME

Wildy Lapointe, 398 Bellevue St., Roberval, Canada (G8H 2R8)

Filed Mar. 8, 1984, Ser. No. 587,688
Int. Cl.[3] A63F *9/08*
U.S. Cl. 273—157 R **8 Claims**



1. An animated block game, comprising:

(a) an open-top box, including side walls and at least one floor;

(b) a plurality of similar regularly-shaped blocks, designed to be removably contained by said box; at least one of said blocks including a rotatable part, embedded therewithin; all of said blocks defining a number of faces each adapted to carry parts of an image such that at least two different composite images may be formed by suitably positioning and orienting the blocks and wherein said rotatable part includes a top movable portion exposed at and occupying a restricted portion of one of said faces of said at least one block, to constitute an animatable portion of one of said images; said one face and animatable portion adapted to carry complementary parts of said one image;

(c) means for driving said rotatable part carried by said box; and

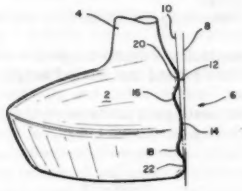
(d) a disconnectable coupling means between said driving means and said rotatable part to allow removal of said one block from said box.

4,508,349

GOLF CLUB

Paul W. Gebauer, 4999 Kahala Ave. #345, Honolulu, Hi. 96816, and Smith Choi, 1317 Laukaki St., Honolulu, Hi. 96821

Filed Nov. 15, 1983, Ser. No. 552,082
Int. Cl.[3] A63B *53/04*
U.S. Cl. 273—175 **8 Claims**



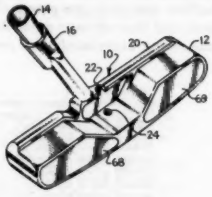
1. A golf club comprising a head having a face for making contact with a golf ball, wherein said face includes a curved surface extending along a central region of said face from a location near the heel in a direction toward the toe of said club, and said fall also includes first and second substantially flat surfaces extending substantially parallel to said direction, said first and second substantially flat surfaces being respectively above and below said curved surface.

4,508,350

GOLF CLUB HEAD

Clovis R. Duclos, 6327 Marina Pacifica Dr., Long Beach, Calif. 90803

Filed Sep. 29, 1982, Ser. No. 428,122
Int. Cl.[3] A63B *69/36, 53/04*
U.S. Cl. 273—183 D **3 Claims**



1. A golf club head including:

a body casting constructed from material having a first predetermined density, said body casting having:

a front golf ball striking surface;

a heel cavity having cast and adhesively bonded therein a predetermined amount of a material having a second predetermined density substantially more dense than said first predetermined density; and

a toe cavity having cast and adhesively bonded therein a predetermined amount of a material having said second predetermined density whereby said head has a high polar moment of inertia to resist turning forces applied to said face; and

a back surface through which said heel and toe cavities open, said heel and toe cavities each including:

a peripheral flange formed adjacent said back surface, and said head further including:

a heel plate connected to said heel flange to close said heel cavity at said back surface; and

a toe plate connected to said toe flange to close said toe cavity at said back surface, wherein said body further includes:

a sole surface intersecting said front golf ball striking surface; and

a center of gravity, said front golf ball striking surface having:

a golf ball striking spot thereon about a golf ball radius above said sole surface, said golf ball striking spot being above said center of gravity.

4,508,351

GAME WITH INDIVIDUAL TWO PART BOARDS

Marilyn Fitzgerald, 117 Matawan Rd., Old Bridge, N.J. 08857

Filed Jun. 13, 1983, Ser. No. 503,543
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—248 **5 Claims**

1. A reincarnational, karmic board game apparatus comprising:

a plurality of individual, two-part playing boards consisting of:

a first playing section containing separate categorical playing spaces within, whereby said spaces have to be covered with playing pieces;

a second playing section having paths marked thereon, characteristically divided into spaces that have a central concavity, whereby, certain of said spaces provide a starting area, an ending area, blank areas, single arrowed detour areas, colored multi-arrowed decision making areas and further colored obsticle areas, whereupon all of the previously mentioned said spaces unite to form a mazed means to take a simulated reincarnational, karmic life journey;

a supplementary game board providing playing and storage areas for supportive ingredients used in cooperation with

the said individual, two-part playing boards, whereby, said ingredients consist of:

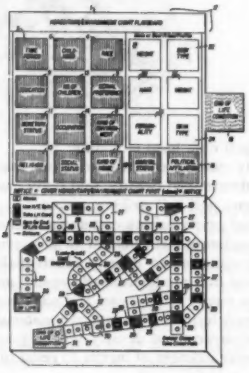
sets of unique, playing markers and their storage areas thereof, whereupon, said markers are used to cover separate categorical spaces of said first playing section of said individual, two-part playing boards;

a plurality of categorical spinner playing devices, providing the referenced indicia and instructions therein, for said markers and their placement thereinafter;

sets of cards and their storage areas thereof, whereby said card sets, being correlated with certain said spaces of said second playing section, are printed with indicia, information and directions, whereas, said indicia, information or directions could alter movements of a playing position;

a plurality of protuberant playing pieces and their storage areas therein, having the shapes of the astrology signs of zodiac, whereby said playing pieces are used as a means to advance along said paths of said concaved spaces;

a spinner device printed with numerals used for the purpose of advancing regular movements of said playing pieces along said paths.



4,508,352

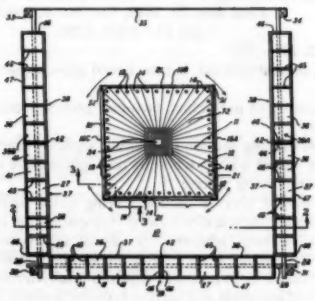
MOUSE TRAP GAME

William C. Johnson, 743 N. Grand Ave., Glendora, Calif. 91740

Filed Sep. 6, 1983, Ser. No. 529,390

Int. Cl.[3] A63F 3/00

U.S. Cl. 273—274 **5 Claims**



1. In a game of chance for a plurality of participants and employing a live small animal the combination comprising a selector arena, vertical transparent fences on the periphery of said arena, stable means supporting said selector arena, a multiplicity of peripheral selector apertures, a trap cup beneath each selector aperture, means releasably securing each cup, a central release area defined on said arena, a color distinct zone extending from said central release area to each peripheral selector aperture, a plurality of participant choice boards each having a color segment matching one of the color zones on the selector arena, transparent hoods movably secured above each choice board, and means for displacing said transparent hoods from above said choice board to afford access thereto by a participant.

4,508,353

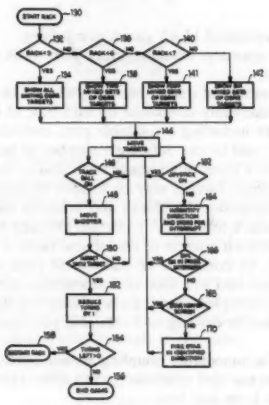
IMAGE MATCHING VIDEO GAME

Steven M. Meyer, Chicago; Wayne A. Kuna, Oak Park; Robert S. Morrison, Vernon Hills; Howard J. Morrison, Deerfield; Richard A. Ditton, and Elaine A. Ditton, both of Arlington Heights, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 22, 1982, Ser. No. 452,390

Int. Cl.[3] A63F 9/22

U.S. Cl. 273—313 **29 Claims**



1. A game involving the elimination of images in matching sets comprising:

means for displaying a plurality of sets of matching images;

each of the images having separable mating components;

player controllable means for selecting one image at a time;

means for retaining a first selected image for a perceptible predetermined time interval;

means for comparing a second selected image with the first selected image;

means for eliminating matching first and second selected images;

means for producing a mixed image of exchanged components of the first and the second images if they do not match; and

means for terminating the predetermined time interval upon player selecting the second image.

4,508,354

MOVING PISTON WITH SELF-TIGHTENING SEALING RING

Flavien Lazarre, Pau, France, assignor to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Mar. 19, 1984, Ser. No. 590,860

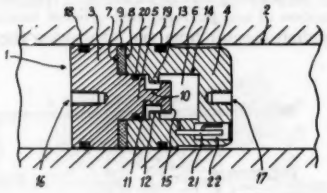
Claims priority, application France, Mar. 21, 1983, 83 04570

Int. Cl.[3] F16J 1/06

U.S. Cl. 277—27 **4 Claims**

1. Packing or sealing device moving in a hollow cylinder comprising two elements of cylindrical external outlines of

dimensions slightly smaller than those of the hollow cylinder, wherein in order that a cylindrical rod extending the first element slides in a cylindrical chamber delimited inside the second element and facing the first element, each of these two



elements are in contact through an annular part with the annular packing or sealing ring, made of Teflon or analog, through which passes the cylindrical rod, this annular packing having substantially the same external diameter as the said elements, when it is not subjected to compression stress.

4,508,355

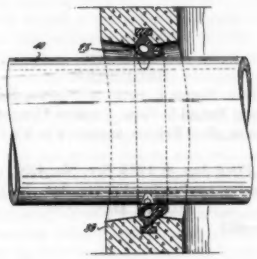
GASKET SUITABLE FOR USE IN SEALING EXTERIOR OF SEWER PIPE TO OPENING IN MANHOLE, AND METHOD AND SYSTEM EMPLOYING SAME

John Ditcher, Langhorne, Pa., assignor to A-Lok Products Corporation, Trenton, N.J.

Filed Mar. 7, 1983, Ser. No. 472,620

Int. Cl.³ F16L *21/02*; F16J *15/32*

U.S. Cl. 277—189 **1 Claim**



1. In a manhole system comprising a manhole having a generally circular wall opening surrounding the outer surface of a generally cylindrical pipe extending through said opening, and a gnerally circular gasket ring of elastomeric material having a uniform cross-section along its circumferential length and comprising a radially-outward foot portion embedded in the wall of said manhole surrounding said opening, a head portion radially inward of said foot portion and bearing against the exterior of said pipe, and a neck portion between said head and foot portions of lesser width than either of them and also embedded in said wall, the radially inward tip of said head portion when undeflected defining a circle of lesser radius than that of the outer surface of said pipe so that when said pipe is inserted into said opening said gasket is deflected axially of said pipe and the side surface of said head portion bears sealingly against said outer surface of said pipe, said head portion tapering from a greater lateral thickness near said neck portion to a smaller thickness near said tip:

the improvement wherein said head portion contains a first cavity and a second cavity each of circular cross-section and spaced radially from each other to define a transverse wall between them, each of said cavities extending completely around the circumference of said gasket, said first cavity being nearer said neck portion and a larger cross-sectional diameter than said second cavity.

4,508,356

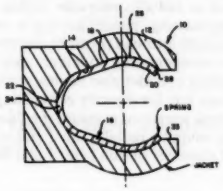
MODIFIED C-SHAPED MECHANICAL SPRING SEAL

Robert Janian, 3845 Ballina Canyon Rd., Encino, Calif. 91436

Filed Jun. 6, 1984, Ser. No. 617,621

Int. Cl.³ F16J *15/12*

U.S. Cl. 277—205 **16 Claims**



1. A resilient spring element for insertion in a jacket having a generally C-shaped cavity comprising:

an elongated member of substantially constant cross section having a sinuous longitudinal configuration, wherein the cross section of the member comprises a modified C-shaped outline having at least two different curvatures, the member including cantilever arm portions of relatively large radius of curvature between the base thereof and a region of greatest width of the member, and terminal portions from the region of greatest width on each side to the tips being of smaller radius of curvature than the cantilever arm portions.

4,508,357

POWER-OPERATED CHUCK FOR TURNING MACHINES

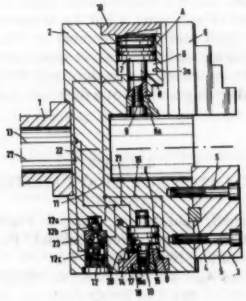
Kurt Reich, Düsseldorf, Fed. Rep. of Germany, assignor to Paul Forkardt GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 505,063

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222751

Int. Cl.³ B23B *31/14*

U.S. Cl. 279—1 C **5 Claims**



1. A power-operated chuck for turning machines, said chuck comprising:

a chuck body;

at least one movable jaw which is radially guided in said chuck body;

a pressure medium cylinder which is provided with a working chamber, and a pressure medium piston which is movably guided in said chuck body; said pressure medium

piston being operatively associated with said at least one movable jaw for actuating same;

a source of pressure medium;

a releasable check valve, with said working chamber of said pressure medium cylinder being connected to said source of pressure medium via said check valve; and

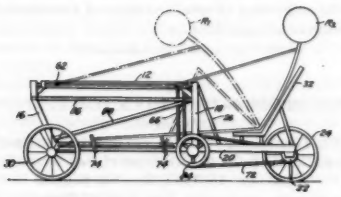
a centrifugal force compensating cylinder having a pressure chamber which communicates with said working chamber of said pressure medium cylinder; said centrifugal force compensating cylinder being provided with a compensating piston which is designed as a centrifugal weight, and which is radially movable within said chuck body; said compensating piston having a radially outer end which projects into said pressure chamber of said centrifugal force compensating cylinder, said centrifugal force compensating cylinder also having a relief chamber; and a short-circuit line for directly connecting said relief chamber with said source of pressure medium; said compensating piston having a radially inner end which projects into said relief chamber of said centrifugal force compensating cylinder.

4,508,358

APPARATUS FOR USE AS PHYSICAL EXERCISER AND MEANS OF LOCOMOTION

David Erel, Kings B/22, Regent St., Bedford View 2008, South Africa

Filed Jun. 25, 1982, Ser. No. 392,254
Claims priority, application Israel, Jul. 15, 1981, 63320
Int. Cl.³ B62M 1/12
U.S. Cl. 280—234 **29 Claims**



1. Physical exercise apparatus comprising a plural wheel vehicle having a chassis, at least one of the wheels being adapted to be positively driven, a stationary seat for a rider on the vehicle, two linearly reciprocable drive members on the vehicle forward of said seats, a link for transmitting the linear movement of each said drive member to the driven wheel while transforming said linear movement to rotatory movement of the driven wheel, and each of said linearly reciprocable drive members is provided at a different level on the vehicle.

4,508,359

AUTOMATIC LATCH FOR DRAFT MEMBER OF BALE HANDLER

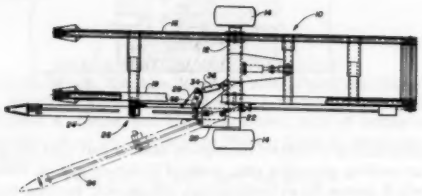
Willis R. Campbell, Ephrata, Pa.; Larry J. Hunt, Novi, Mich., and T. William Waldrop, New Holland, Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 18, 1983, Ser. No. 485,938
Int. Cl.³ B60D 1/00
U.S. Cl. 280—463 **11 Claims**

8. In a mobile transport unit for handling bales of crop material, said mobile transport unit having an elongated frame with a pair of side rails for supporting said bales of crop material, a draft member pivotally connected to said elongated frame and adapted for connection to a towing vehicle, said draft member being movable between a transport position adjacent one of said side rails and a field position extending outwardly from said one side rail, fluid-operated cylinder means interconnected between said draft member and said elongated frame for moving said draft member between said field and transport positions, the improvement comprising:

latch means arranged for securing said draft member against horizontal movement away from said one of said side rails when in said transport position;

means for releasing said latch means in response to initial actuation of said fluid-operated cylinder means to move said draft member from said transport position toward



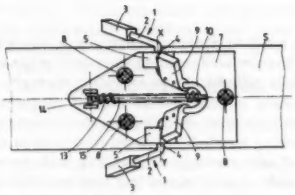
said field position, and one end of a piston rod of said cylinder means is pivotally connected thereto with limited amount of lost motion, whereby the initial movement of said piston rod in a direction to move said draft member away from said side rail actuates said means operable to move said latch member to said retracted position, whereby continued pressure by said cylinder mens against said draft member moves said draft member toward said field position and maintains it therein.

4,508,360

SKI BRAKE

Jean Beyl; Jean Bernard, both of Nevers; René Guérreau, Montmarault; Daniel le Faou, Varennes Vauzelles, and Henri Peyre, Nevers, all of France, assignors to Ste LOOK, Nevers, France

Filed Jan. 4, 1983, Ser. No. 455,579
Claims priority, application France, Jan. 26, 1982, 82 01146
Int. Cl.³ A63C 7/10
U.S. Cl. 280—605 **2 Claims**

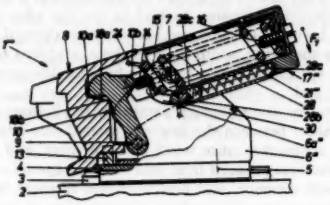


1. In a ski brake comprising two braking arms placed on each side of the ski, each braking arm being elbowed so as to form a bottom section which is adapted to carry a braking shoe, an intermediate section pivotally mounted on the ski with a predetermined degree of play in a transverse bearing fixed on the ski and a top section subjected to the pressure of the ski boot when said boot is in position; the improvement comprising a pivotal control flap carried by the top section of each braking arm, and a top arcuate connecting member having two legs one of which legs is connected to each of said flaps, each said flap having two separate bores which are inclined at an angle with respect to each other and serve as swivel-bearings respectively for said top section of the corresponding braking arm and for the respective leg of said top arcuate connecting member.

4,508,361
SAFETY SKI BINDING

Josef Svoboda, Schwechat; Theodor Nitschko, and Heinz Wittmann, both of Vienna, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Nov. 12, 1982, Ser. No. 441,148
Claims priority, application Austria, Nov. 12, 1981, 4854/81
Int. Cl.³ A63C 9/08
U.S. Cl. 280—628 **11 Claims**



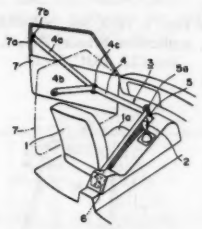
1. A safety ski binding, comprising: a support member; a sole holder supported for pivotal movement around a swivel axis on said support member between release and downhill skiing positions; locking means for releasably holding said sole holder in said downhill skiing position, said locking means permitting said sole holder to move away from said downhill skiing position only after predetermined release forces are exceeded, said locking means including a locking part provided on a pivotally supported locking lever, said locking lever having on a side remote from said locking part a control surface which is slidably engaged by a slide member which is biased toward said control surface by a release spring supported on a spring housing, said spring housing being supported in a manually operable release lever which is pivotally supported for movement about a swivel axis wherein said slide member is, in every position of said locking lever when said sole holder is in said downhill skiing position, substantially normal to said control surface; and centering means cooperable with said release lever and said spring housing for yieldably resisting pivotal movement thereof away from an initial positon, said centering means including a leaf spring having one end secured on said spring housing and having section adjacent said one end which is supported, in said downhill skiing position, on a surface of said sole holder, wherein said leaf spring is secured on a part of said spring housing which covers said release spring from above, engages an inner surface of said sole holder which faces said locking lever, and is arranged to extend between two support pins which are secured on said support member, which are parallel to the swivel axis of said spring housing, and which are offset with respect to one another in a direction longitudinally of the ski and also in a direction normal to the upper side of the ski.

4,508,362
PASSIVE SEAT BELT DEVICE

Kazuo Higuchi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1983, Ser. No. 495,250
Claims priority, application Japan, May 19, 1982, 57-84287
Int. Cl.³ B60R 21/10
U.S. Cl. 280—804 **7 Claims**

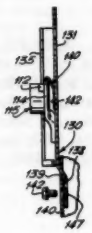
1. A passive seat belt device for a vehicle having a seat belt with both ends fixed by means to the vehicle body, at least one of said both ends being connected to a seat belt retractor means, a guide member which guides said seat belt in the longitudinal direction of the vehicle body and a drive means for driving said guide member, the loading and release of said seat belt for a person in the seat being effected by the longitudinal movement of said guide member driven by said drive means, the improvement comprising, a switch means provided for controlling the drive means and stopping the movement of said guide member at a predetermined position upon the condition that another vehicle member is interposed in the forwardly moving path of said guide member.



4,508,363
ADJUSTABLE SEAT BELT ANCHORAGE

John D. Temple, Carlisle, England, assignor to ASE (UK) Limited, Cumbria, England

Filed Feb. 10, 1983, Ser. No. 465,610
Claims priority, application United Kingdom, Feb. 11, 1982, 8203979
Int. Cl.³ A62B 35/02
U.S. Cl. 280—808 **10 Claims**



1. Anchorage means for a belt of a seat belt system, said anchorage means comprising:

carriage means having support means for said belt,

track means for guiding said carriage means for movement therealong,

locking means for locking said carriage means against said movement along said track means,

said locking means comprising a first locking element on said carriage means and a series of second locking elements spaced along said track means,

said carriage means being rockable between a first position in which said first locking element is in engagement with a selected second locking position to lock said carriage means at a selected position on said track means and against said movement along said track means from said selected position and a second position in which said first locking element is released from said second locking element to permit said movement of said carriage means along said track means to a different selected position on said track means, and

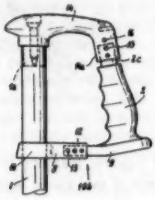
resilient biassing means biassing said carriage means into said first position.

4,508,364

SKI POLE

Claude Joseph, Sallanches, France, assignor to Kerma, Sallanches, France

Filed Dec. 1, 1982, Ser. No. 445,977
Claims priority, application France, Dec. 3, 1981, 81 22967
Int. Cl.³ A63C *11/22*
U.S. Cl. 280—821 **5 Claims**



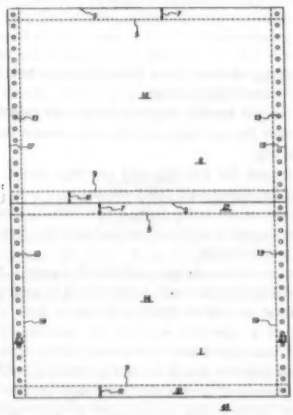
1. A ski pole comprising:
a shaft having an upper end and a lower end;
a grip mounted on said upper end; and
means for fixing said grip to said shaft so that the axis of said grip is rearwardly offset from the axis of said shaft, said grip being located at the level of the upper end of said shaft and oblique thereto, said means for fixing said grip to said shaft including adjustment means for varying the angle of the axis of said grip relative to the axis of said shaft, said means for fixing said grip to said shaft being formed by an upper arm connecting the upper portion of said grip with the upper end of said shaft and a lower arm connecting a lower portion of said grip with said shaft, means being provided on at least one of said arms for adjusting the effective length thereof.

4,508,365

CONTINUOUS FORM PAPER WITH PULL TABS FOR EASIER SEPARATION

Debra K. Hawes, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 21, 1983, Ser. No. 477,582
Int. Cl.³ B42D *15/00*; B41L *1/20*; B65D *27/10*
U.S. Cl. 281—2 **7 Claims**



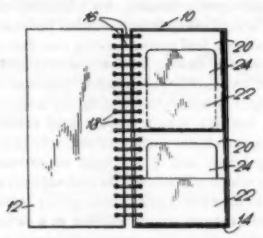
1. A material construction which facilitates continuous form feed comprising:
a plurality of rectangular sheets of material, each sheet being identical in configuration to the other sheets and having top and bottom edges extending parallel to one another and first and second side edges extending between said top and bottom edges and parallel to one another, said sheets being coupled to one another along a fold line defined between an interconnection of said bottom edge of one sheet with the top edge of the next successive sheet of said plurality of sheets, said sheets folding at said fold line to enable stacking of said sheets one upon the other to form a bundle having the same rectangular configuration as a sheet;
a top tear line extending parallel to the top edge of each sheet between the first and second side edges of a sheet across the entire width of each sheet, said first tear line being spaced from said top edge by a predetermined distance; and
a bottom tear line extending parallel to the bottom edge of each sheet between the first and second side edges of a sheet across the entire width of each sheet, said second tear line being spaced from said bottom edge by a predetermined distance, said predetermined distance between the bottom tear line and the bottom edge of one sheet being equal to said predetermined distance between the top tear line and the top edge of the next succeeding sheet such that when said sheets are folded to form a stack, the sheets forming said stack may be separated by tearing along a single line adjacent said top edges and a single line adjacent said bottom edges of said sheets formed by the stacked alignment of the bottom tear line of one sheet with the top tear line of the next successive sheet.

4,508,366

HOLDERS FOR COMPUTER DISKS AND THE LIKE

Robert J. Brindle, Witney, England, assignor to James Burn International Limited, England

Filed Nov. 4, 1982, Ser. No. 439,075
Claims priority, application United Kingdom, Nov. 23, 1981, 8135239; Jan. 12, 1982, 8200752
Int. Cl.³ B42D *3/12*, *3/18*; B65D *85/57*; B42F *5/00*
U.S. Cl. 281—36 **8 Claims**



1. A disk holder of book-like configuration, said holder comprising
a plurality of finished pages, at least one of said finished pages being formed from an unfolded page having a width twice the width of said finished page, said unfolded page also having a length greater than the length of said finished page,
at least one pocket formed on each of the front and back faces of that one of said finished pages made from said unfolded page, each of said pockets being closed along a bottom edge by folding the excess length of said unfolded page relative to the length of said finished page, and each of said pockets being closed along one longitudinal side edge by folding said unfolded page along a longitudinal median line of said unfolded page, each pocket being sized to receive a disk therein, and
a binding element that binds together the opposite side edges of said unfolded page after said unfolded page has been

folded into finished page configuration with front and back face pockets formed thereon, each of said pockets being closed along another longitudinal side edge by said binding element, and said binding element serving to bind together all finished pages with or without pockets thereon, thereby forming said disk holder.

4,508,367

CONNECTOR

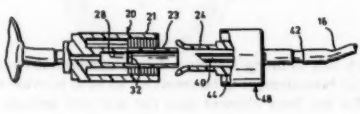
Dimitrios G. Oreopoulos, 10 Ladywood Dr., Rexdale, Ontario; Gabor Zellerman, deceased, late of Ottawa, both of Canada, and by Robert G. Price, administrator, 1801 - 20 Driveway, Box 1565, Stn. B, Ottawa, Ontario, Canada (K1P 5R5)

Continuation-in-part of Ser. No. 111,264, Jan. 11, 1980, abandoned. This application Nov. 17, 1982, Ser. No. 442,457

Claims priority, application Canada, Jan. 15, 1979, 319367

Int. Cl.[3] **F16L** *35/00*

U.S. Cl. 285—3 **10 Claims**



1. A coupler comprising a first part, said first part having a first cupped member integral therewith, said first cupped member having a bottom and an open end, said first cupped member having an exterior cylindrical wall extending rearwardly of the open end to said bottom and formed integral therewith and a flow opening extending through the bottom of said first cupped member;

a second part, said second part having a second cupped member integral therewith, said second cupped member having a bottom and an open end, said second cupped member having an interior cylindrical wall extending from the open end to said bottom and formed integrally therewith and a flow opening extending through the bottom of said second cupped member;

the said interior cylindrical wall of the second cupped member and said exterior cylindrical wall of the first cupped member having diameters for sliding relation with respect to each other whereby the two cupped members can be telescoped with respect to each other along an axis common to the cylindrical axis of their said respective cylindrical walls when the cylindrical axes of their respective cylindrical walls are aligned and their open ends are opposed whereby said first part and a second part are telescopical with respect to each other;

a connector for each of said cupped members for joining fluid flow between the flow openings of said cupped members, said connector in each of said cupped members being spaced inwardly from the open end of its respective cupped member, said connectors being aligned in their respective cupped members and adapted to connect together in fluid flow relation within the first cupped member as the cupped members are telescoped together;

an end portion of the inside cylindrical wall of said second cupped member being flared outwardly adjacent its open end to a diameter greater than the outside diameter of said first cupped member whereby to cooperate therewith and guide said cupped members into axial alignment when they are telescoped together;

the said cupped members when fully telescoped together to dispose the interior cylindrical wall of the second cupped member and the exterior cylindrical wall of the first cupped member in fully telescoped relation being adapted to cooperate and support said connectors connected in fluid flow relation and means for holding said connectors connected.

4,508,368

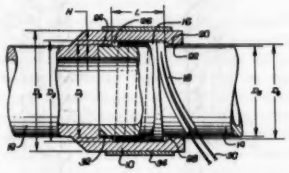
PLASTIC PIPE JOINT

James J. Blumenkranz, Hollywood, Calif., assignor to R & G Sloane Mfg. Co., Inc., Sun Valley, Calif.

Filed Mar. 1, 1982, Ser. No. 353,157

Int. Cl.[3] **F16L** *47/02*

U.S. Cl. 285—21 **10 Claims**



1. A bonding sleeve assembly for thermally bonding a first thermoplastic article to a second thermoplastic article, comprising:

an enlarged generally cylindrical extension formed on one end of the first article having an opening for receiving one end of the second article;

an internal annular recess formed within said enlarged extension and spaced axially a short distance from the one end of the first article to define a first internal annular land and between said recess and the one end of the first article;

a second internal annular land spaced axially from the first land and separated therefrom by said recess;

a spiral welding coil formed from thermoplastic material surrounding a heating element for insertion into said recess, said coil having an outside diameter generally corresponding with the inside diameter of said recess and an inside diameter generally corresponding with the inside diameter of the first land, said coil being manually compressible to a reduced diametric size to fit past the first land and having sufficient elasticity to return substantially to its original diametric size when positioned in said recess, the thermoplastic material being fusible when electrical current is passed through the heating element to bond the first and second articles with respect to each other; and

means for compressing said first and second lands against the second article and constraining the expansion of the thermoplastic material within said recess when heated by the heating element, thereby increasing the pressure within said recess.

4,508,369

RELEASABLE COUPLING DEVICE

Paul Mode, Westfield, N.J., assignor to Nycoil Corporation, Fanwood, N.J.

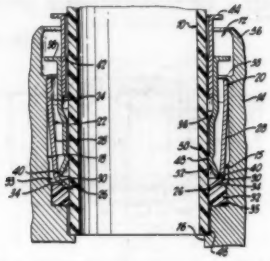
Continuation-in-part of Ser. No. 912,003, Jun. 2, 1978, Pat. No. 4,440,424. This application Jan. 4, 1980, Ser. No. 109,680

Int. Cl.[3] **F16L** *35/00*

U.S. Cl. 285—39 **10 Claims**

1. A releasable coupling device for a tube of the type including a fitting having a bore therein and an opening into the bore through which the tube is to be inserted, the internal diameter of said opening being greater than the diameter of said bore, and said opening having a first end adjacent said bore and a second end opened to the exterior of said fitting; a retaining ring in said opening having a plurality of axially extending, inwardly biased fingers adapted to engage said tube when said tube is inserted into said fitting towards said bore so that said tube is restrained against axial movement out of said fitting; unlocking means for forcing said plurality of fingers radially outward to cause disengagement of said fingers from said tube; annular sealing means positioned in said opening for sealing said tube and said fitting when said tube is inserted therethrough, the improvement comprising;

each of said fingers having gripping portions at the ends thereof for engaging said tube, said gripping portions having opposing substantially planar surfaces, said fingers along their entire length having a substantially rectangular



cross-section, and said retaining ring being comprised of a multi-sided web portion having a plurality of sides in which adjacent sides define a plurality of corners, each of said fingers depending from one of said sides of said multi-sided web portion.

4,508,370

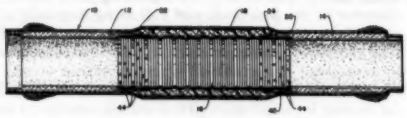
RIGID DUCT WITH BENDABLE ELBOW

Clifford A. Schroeder, 4011 E. Skelton Canyon Cir., Westlake Village, Calif. 91316

Division of Ser. No. 317,194, Nov. 2, 1981, Pat. No. 4,400,863. This application Aug. 1, 1983, Ser. No. 518,943

Int. Cl.³ F16L *21/00*

U.S. Cl. 285—53 **4 Claims**



1. A fiberglass duct assembly having an integral bendable tubular elbow comprising;

a bendable metal foil tubular elbow;

a first section of rigid tubular fiberglass duct overlapping one end of said bendable elbow;

a second section of rigid tubular fiberglass duct overlapping the other end of said bendable elbow;

said overlapping portions of said first and second rigid tubular fiberglass being bonded to said ends of said bendable elbow by compression against the ends of said bendable elbow during curing;

insulating material wrapped around the bendable elbow between said overlapping ends; and

a flexible tubular jacket covering said first and second rigid fiberglass tubular ducts and said bendable elbow.

4,508,371

EASY ACCESS PULLEY BOX

William Maier, 465 Gulf St., Milford, Conn. 06460

Filed Feb. 1, 1983, Ser. No. 462,998

Int. Cl.³ F16L *45/00*

U.S. Cl. 285—121 **7 Claims**

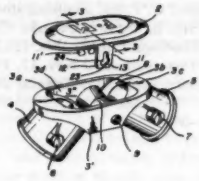
1. A conduit coupler comprising a hollow housing body having opposed outer side walls, an access opening into the interior of said body, mechanism within said body and a removable cover plate which covers said access opening, the improvement comprising means facilitating easy and quick assembly and disassembly of said cover plate and housing body, said means comprising:

boss elements projecting from said opposed outer body side walls;

pairs of split ear elements extending normal from the cover plate and each element pair defining a slot means which, in assembly of the cover plate and housing body, is aligned with and adapted to receive a said boss element;

the free ends of each slot defining ear structure being divergent, whereby to facilitate reception of said boss element;

each slot defining ear structure having opposed cut-out arcuate portions adapted to accommodate said received boss element and



each slot defining structure being dimensioned relative to the boss element to be received, so as to provide a snap fit for the boss element into the slot and arcuate portion thereof to thereby positively fasten the cover plate to said housing body and yet permit easy and quick cover plate removal without the use of tools,

a shaft disposed within said housing in operative association with said mechanism,

said shaft extending through apertures in said opposed body side walls and the thus extended shaft ends providing said boss elements which are received and snap fit in the arcuate portions of said slots.

4,508,372

GREASE GUN EXTENSION ASSEMBLY

Frank L. White, 870 Bridge St., Philadelphia, Pa. 19124

Filed Jun. 5, 1981, Ser. No. 270,700

Int. Cl.³ F16L *55/00*

U.S. Cl. 285—175 **10 Claims**

1. A grease gun extension apparatus capable of coupling to a grease gun fitting, comprising;

a ball type grease fitting having a threaded end and a bore therethrough capable of coupling to said grease gun fitting;

an extension nipple having a bore therethrough and connected to one end thereof to said threaded end of said ball type grease fitting and having a threaded portion on the opposite end thereof;

a hollow tube having a longitudinal axis and an annular compression ring about its outer surface at a first end thereof, said first end abutting said opposite end of said extension nipple and having a tapered tip at the other end thereof, said tapered tip being defined by two tapered regions, the first tapered region being spaced from the end of the tip and being at a greater angle relative to the longitudinal axis than the second tapered region which extends from the end of the tip to said first tapered region and

a compression nut having an internal tapered surface for compressively engaging said annular compression ring, said compression nut threadedly engaging said threaded opposite end of said extension nipple by deforming said

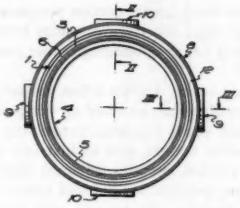
compression ring into sealing engagement with said hollow body, compression nut and opposite end of the extension nipple as said nut is tightened for sealingly holding said hollow tube to said extension nipple.

4,508,373

UNIVERSAL JOINT

Leslie M. Ward, Horton Rd., Ashley Heath, Ringwood, Dorset, England

Filed Oct. 25, 1982, Ser. No. 436,580
Int. Cl.³ F16L *27/00*
U.S. Cl. 285—226 **15 Claims**



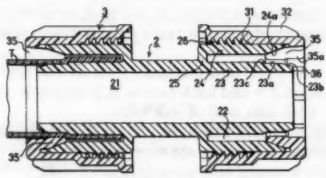
1. A universal joint for a fluid conduit comprising a pair of tubular connectors with cylindrical end portions adapted to be sealingly secured to two adjacent parts of the conduit, a bellows with respective cylindrical ends sealingly secured within the cylindrical end portions of the tubular connectors, which are also formed with spherically shaped portions fitting one within the other outside the bellows, a spherically shaped load transmitting sleeve having recesses within which there are pivoted two pairs of diametrically opposed pivots disposed in the plane of the equator of said sleeve at right angles to each other, with one pair of pivots connecting the sleeve and the outer spherically shaped connector portion, and with the other pair of pivots connecting the sleeve and the inner spherically shaped connector portion.

4,508,374

TUBE CONNECTION FITTINGS

Itzhak Kantor, Menashe, Israel, assignor to Plasson Maagan Michael Industries Ltd., Menashe, Israel

Filed Sep. 30, 1982, Ser. No. 431,013
Claims priority, application Israel, Nov. 26, 1981, 64379
Int. Cl.³ F16L *19/00*
U.S. Cl. 285—319 **7 Claims**



1. A connection fitting for effecting a connection to a tube, comprising:

a body member formed with an annular recess extending axially inwardly of one end of the body member to define an inner tubular portion and an outer sleeve portion integrally joined to the tubular portion at its inner end and spaced therefrom at its outer end for receiving an end of the tube to be connected thereby;

a cap threaded onto said body member and including an end wall formed with an opening circumscribed by a plurality of fingers adapted to engage the end of the tube received within said recess;

each of said fingers including a flexible juncture to said cap and an axial extension extending inwardly in said space between the inner tubular portion and outer sleeve portion of the body member defined by said annular recess;

the thickness and diameter of said annular recess throughout its length being at least as large as the thickness and diameter of the tube to be connected thereto;

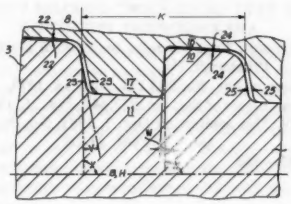
the outer end of said annular recess being shaped such that the outer face of said tubular portion of said body member is inwardly stepped, and the inner face of said sleeve portion being inwardly tapered from its outer edge, whereby said outer shaped end of the annular recess is effective, upon receiving the fingers of the threaded cap, to accommodate slightly different-sized tubes within said annular recess, to securely lock the tube within said recess, and to effectively seal the tube within said recess.

4,508,375

TUBULAR CONNECTION

Billy R. Patterson, Diana, and Warren P. Schneider, Dallas, both of Tex., assignors to Lone Star Steel Company, Dallas, Tex.

Filed Sep. 20, 1982, Ser. No. 420,475
Int. Cl.³ F16L *25/00*
U.S. Cl. 285—334 **4 Claims**



1. A joint for heavy wall, high performance tubulars comprising:

a male member and a female member having engagable threads disposed on respective first and second substantially matching tapers of about 1.750 inches per foot on diameter,

said first taper having a tolerance of from +0.000 inch per inch to −0.003 inch per inch on diameter, said second taper having a tolerance of from +0.0045 inch per inch to −0.000 inch per inch on diameter, the plus and minus tolerances of the first and second tapers being such that the taper on the male member is less than the taper on the female member,

said threads on the first taper having a substantially rectangular form with rounded corners and parallel crests and roots, said crests and roots being parallel to the plane of the first taper, a 0.200 inch thread pitch, a 3° load flank, a 10° trailing flank, and a 0.062 inch thread height with a tolerance of from +0.001 inch to −0.001 inch, said first taper thread crests having a length of 0.099 inch with a tolerance of from +0.000 inch to −0.001 inch, the rounded crest corner on the load flank end having a radius of 0.008 inch with a tolerance of from +0.002 inch to −0.000 inch, and the rounded crest corner on the trailing flank end having a radius of 0.030 inch with a tolerance of from +0.002 inch to −0.000 inch, said first taper thread roots having a length of 0.101 inch with a tolerance of from +0.001 inch to −0.000 inch, the rounded root corners on the load and the trailing flank ends having a radius of 0.008 inch with a tolerance of from +0.000 inch to −0.002 inch,

said threads on the second taper having a substantially rect-

angular form with rounded corners and parallel crests and roots, said crests and roots being parallel to the plane of the second taper, a 0.200 inch thread pitch, a 3° load flank, a 10° trailing flank, and a 0.062 inch thread height with a tolerance of from +0.001 inch to −0.001 inch, said second taper thread crests having a length of 0.099 inch with a tolerance of +0.000 inch to −0.001 inch, the rounded crest corners on the load and the trailing flank ends having a radius of 0.008 inch with a tolerance of from +0.002 inch to −0.000 inch, said second taper thread roots having a length of 0.101 inch with a tolerance of from +0.001 inch to −0.000 inch, the rounded root corner on the load flank end having a radius of 0.008 inch with a tolerance of from +0.000 inch to −0.002 inch, and the rounded root corner on the trailing flank end having a radius of 0.030 inch with a tolerance of from +0.000 inch to −0.002 inch, whereby, as compared with the joint of API Standard 5B an improved joint is provided having an advantageous taper mismatch providing higher bearing pressure and sealing within the made-up joint adjacent the narrow end of the male member, a reduced maximum mated thread clearance, less imperfect thread length with an increase in overall thread length to provide a greatly increased leakage path, increased wall thickness of the female member at the narrow end of the second taper, deeper stabbing, and reduced male member-in-female member position tolerance.

4,508,376

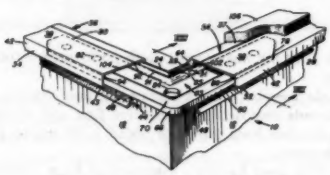
FLANGE TYPE DUCT JOINT ASSEMBLY AND SEAL ARRANGEMENT THEREFOR

Peter J. Arnoldt, Puce, Canada, assignor to Ductmate Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 933,179, Aug. 14, 1978, , which is a continuation-in-part of Ser. No. 872,644, Jan. 26, 1978, Pat. No. 4,218,079. This application Dec. 7, 1981, Ser. No. 327,934

Int. Cl.³ F16L *23/00*

U.S. Cl. 285—363 **7 Claims**



1. A flange type duct joint assembly to connect end portions of generally rectangular duct sections comprising,

duct sections having a generally rectangular configuration with end portions,

said duct section end portions having corner portions with corner edge portions,

a plurality of duct connecting flanges,

said duct connecting flanges each having an upstanding corner piece receiving portion with a front wall, a rear wall and a corner piece receiving opening therebetween,

said duct connecting flanges each having a duct receiving portion with a top wall and a bottom wall,

said duct connecting flange upstanding corner piece receiving portion front wall intersecting said duct receiving portion bottom wall,

a plurality of corner pieces for connecting adjacent duct connecting flanges,

said corner pieces each having a corner section and a pair of legs extending angularly from said corner section, said corner piece corner section and said legs having a common front planar surface portion and a common rear planar surface portion,

said corner piece legs arranged to extend into said duct connecting flange upstanding corner piece receiving opening to connect adjacent duct connecting flanges and form a generally rectangular frame,

said duct section end portions arranged to extend into said duct connecting flange duct receiving portions between said top wall and said bottom wall and into substantially abutting relation with said duct connecting flange upstanding corner piece receiving portion front wall,

external gasket means positioned in overlying relation with said duct connecting flange front wall and a portion of said corner piece corner section,

said corner piece corner section having an offset corner portion displaced rearwardly from said front planar surface,

said corner piece offset corner portion positioned externally of said corner piece receiving openings in said adjacent duct connecting flange upstanding corner piece receiving portions, and

said corner piece corner section offset corner portion displaced rearwardly relative to said corner piece front planar surface and above said duct connecting flange duct receiving portion bottom wall so that said duct section corner edge portion, between adjacent duct connecting flange portions, projects beyond said corner piece offset portion into abutting relation with said external gasket means positioned on said corner piece corner section to provide a seal for said duct corner edge portion between adjacent duct connecting flange portions.

4,508,377

DOOR HANDLE UNIT

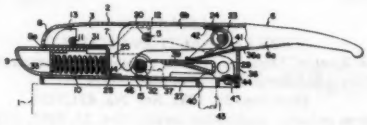
Kunihiko Takasaki, Tokyo, Japan, assignor to Takigen Zeizous Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,867

Claims priority, application Japan, Apr. 8, 1982, 57-49897[U]

Int. Cl.³ E05C *1/14*

U.S. Cl. 292—166 **8 Claims**



1. A door handle unit comprising:

a unit body to be secured to a door;

a lever type handle pivoted to said body by means of a main shaft mounted between upper and lower side walls of said body;

a latch case fitted into said body from its rear side;

a latch housed in said latch case so as to protrude and retreat from a left side wall of said body;

a spring pressedly fitted between a receiving plate and a latch head portion of said latch case, for urging said latch to slide leftward relative to said latch case;

a strike shaft mounted between the upper and lower side walls of said body;

hook portions formed to project from the front portions of said latch case and opened rightward, in which said hook portions are engaged with said main shaft and said strike shaft respectively;

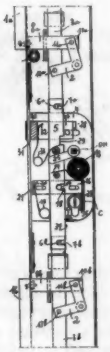
and an actuating projection formed at the left end portion of said handle which is brought into pressure-contact with the left side face of a receiving portion formed at the right end of said latch, thereby to urge said latch case to move rightward with respect to said body and said spring.

4,508,378

DOOR LOCKING DEVICE

Zvi H. Rochman, 21 Brodetski St., Netanya, Israel

Filed Mar. 9, 1983, Ser. No. 473,637
Claims priority, application Israel, Jul. 7, 1982, 66249
Int. Cl.³ E05C *9/02*
U.S. Cl. 292—333 **14 Claims**



1. A door locking device, comprising:

a locking bolt movable to a retracted position to release the door for opening and closing movements within a door frame, or to a projected position to lock the door in its closed position within the door frame;

a coupling member coupled to said locking bolt and biased from an unlocking position retracting said bolt, to a locking position projecting said bolt to lock the door in its closed position within the door frame;

a manually-operated mechanism including a first latching pin manually movable to a first position for latching said coupling member in its locking position, or to a second position for unlatching said coupling member and permitting same to move under its bias to its locking position;

a feeler member biased to a projected position to project past the door and engageable with the door frame when the door is in its closed position so as to be moved to a retracted position;

and a second latching pin coupled to said feeler member such that when the feeler member is in its projected position said second latching pin also latches said coupling member in its locked position but is effective, when the feeler member engages the door frame in the closed position of the door, to automatically unlatch said coupling member permitting same to move under its bias to its locking position and to move said locking bolt to its projected position locking the door in its closed position within the door frame.

4,508,379

LOCKING DEVICE OF AN AUTOMOTIVE DOOR

Haruo Mochida, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jul. 15, 1982, Ser. No. 398,660
Claims priority, application Japan, Aug. 19, 1981, 56-130606
Int. Cl.³ E05B *3/00*
U.S. Cl. 292—336.3 **11 Claims**

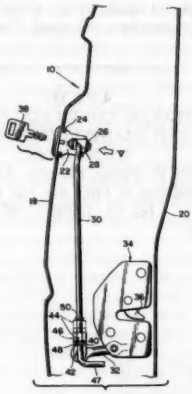
1. A locking device of an automotive door, comprising:

a catching device mounted in said door and including a hook member and a lever member, said hook member being locked when said lever member moves in a first direction and unlocked when said lever member moves in a second direction;

a key cylinder rotatably mounted to said door, said key cylinder being rotatable about an axis thereof relative to said door only when handled by a specified key inserted in said key cylinder;

an arm securely connected to an end of said key cylinder and extending radially outward therefrom;

a rod pivotally connected to said arm and extending therefrom toward said lever member, so that rotation of the key cylinder about the axis thereof induces an axial movement of the rod;



a play providing device including a pair of spaced stoppers interposed between an extending end of said rod and said lever member, so that play is provided between said rod and said lever upon relative movement therebetween; and

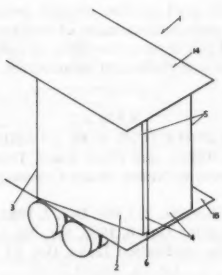
a deflector spaced from said pair of spaced stoppers and connected to said rod to move therewith, said deflector having at least a portion extending along said lever of said catching device to prevent tampering with said catching device.

4,508,380

TRUCK AFTERBODY DRAG REDUCING DEVICE

Mithra M. K. V. Sankrithi, 417 Bellevue Way SE. #400, Bellevue, Wash. 98004

Filed Aug. 20, 1982, Ser. No. 409,938
Int. Cl.³ B62D *35/00*; **B60P** *1/00*
U.S. Cl. 296—1 S **20 Claims**



1. An improved cargo containing truck afterbody of the type which includes in combination a fixed roof and a fixed floor on the top and bottom of the interior region of said truck afterbody, fixed front side panels on the front sides of said interior region, and rear closure members to the rear of said interior region, wherein the improvement comprises:

movable rear side panels attached at their leading edges to

said fixed front side panels and at their trailing edges to said rear closure members;

the cargo containing afterbody volume partially bounded by said rear side panels;

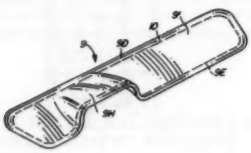
and means for permitting said rear side panels and said rear closure members to be repositioned in such a manner that the equivalent aerodynamic blunt base area of said truck afterbody is reduced and the aerodynamic drag coefficient attributable to said truck afterbody is reduced, wherein in the repositioned configuration of the rear side panels and rear closure members the truck afterbody length is not increased.

4,508,381

SNAP-ON PLASTIC COVER FOR SUN-DAMAGED VINYL COVERED DASHBOARD PADS AND METHOD OF MAKING

Asa Herring, 2201 W. Potter, Phoenix, Ariz. 85027

Filed Dec. 6, 1982, Ser. No. 447,146
Int. Cl.³ B60R *27/00*
U.S. Cl. 296—70 **4 Claims**



1. A rigid snap-on cover for covering a curved vinyl-covered dashboard pad installed on a dashboard substructure in an automobile, said vinyl-covered dashboard pad having predetermined contours of its upper surface and a rounded peripheral back draft portion that meets the automobile's dashboard substructure, said snap-on cover being composed of thermoplastic and including an upper portion having a shape that conforms precisely to the curved shape of said vinyl-covered dashboard pad, said thermoplastic cover also having a rounded peripheral back draft portion that conforms to the shape of said peripheral back draft portion of said vinyl-covered dashboard pad, said rounded peripheral back draft portion of said snap-on cover extending inwardly to grip the round peripheral back draft portion of said vinyl covered dashboard pad, said rounded peripheral back draft portion extending around the entire periphery of said snap-on cover, wherein said rounded peripheral back draft portion extends inwardly sufficiently little to allow snap-on installation of said snap-on cover onto said dashboard pad without loosening or removing said dashboard pad from said dashboard substructure.

4,508,382

GUTTER STRUCTURE FOR A VEHICLE BODY

Akio Tsumoto, Tokyo, and Hisae Kano, Tokorozawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 327,969, Dec. 7, 1981, abandoned. This application Dec. 8, 1983, Ser. No. 559,442
Claims priority, application Japan, Dec. 12, 1980, 55-174687
Int. Cl.³ B62D *25/06*
U.S. Cl. 296—213 **3 Claims**

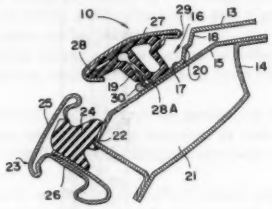
1. A vehicle body structure comprising:

(a) a roof edge rail having an inclined outer panel with an outer edge, and a corner positioned at said outer edge;

(b) a roof panel having a side bent downward, said side extending to the outer panel and then extending adjacent and parallel to the outer panel and finally being bent generally upward away from the outer panel, whereby the roof panel side forms a gutter channel, the parallel portions of the roof panel side and the outer panel being fixed to each other;

(c) a door sash movable relative to the roof edge rail into and out of a closed position;

(d) a weather strip attached to the door sash and engaging the corner of the roof edge rail when the door sash is in the closed position;



(e) a molding, extending from a position near the downward bend of the roof panel to another position near an upper edge of the door sash in its closed position, for covering a recess between the downward portion of the roof panel side and the door sash in the closed position, the outer surfaces of the roof panel, the door sash, and the molding forming a smooth convex contour; and

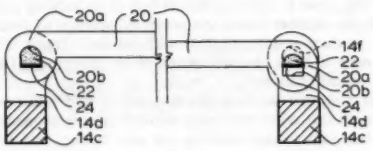
(f) a clip attaching the molding to the upward portion of the roof panel side.

4,508,383

RESILIENT BLADDER TYPE SUSPENSION SYSTEM FOR A SUPPORT STRUCTURE SUCH AS A CHAIR, BED, OR THE LIKE

Karl S. Gaskins, 117 W. Park Dr., Raleigh, N.C. 27605

Filed Aug. 30, 1982, Ser. No. 412,399
Int. Cl.³ A47C *7/14, 7/46*
U.S. Cl. 297—284 **8 Claims**



1. A body support structure such as a chair, bed or the like provided with a fluid bladder type suspension system comprising: a main frame structure having a load bearing area and an elongated bladder holding area; body support means incorporated into said body support structure and extending adjacent said main frame structure and including bladder receiving means; a fluid receiving elongated inflatable bladder adapted to contain air interposed between said load bearing area of said main frame structure and said body support means providing a fluid cushion type support for said body support means and which enables said body support means when under load to move in a floating fashion with respect to said main frame structure; said elongated inflatable bladder being held by the bladder holding area of said main frame structure and said bladder receiving means of said body support means such that said elongated bladder tends to connect said body support means with said main frame; said bladder holding area of said main frame structure being formed by a plurality of spaced apart bladder holding arms with respective bladder holding arms of said main frame structure including an opening formed therein for receiving said elongated inflatable bladder; and wherein said body support means including a plurality of independent support members with each of said support mem-

bers including a bladder holding arm with an opening formed therein and wherein said bladder holding arms of said main frame structure and wherein said elongated inflatable bladder is threaded through the openings of said bladder holding arms of both said main frame structure and said plurality of independent support members.

4,508,384

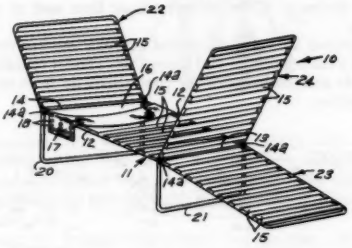
PREGNANCY-SUPPORTING LOUNGE CHAIR

Lawrence E. Castelot, and Linda A. Castelot, both of 168 Glendale Ave., Bridgeport, Conn. 06606

Filed Sep. 27, 1982, Ser. No. 424,402

Int. Cl.³ A47C *1/024*

U.S. Cl. 297—284 **3 Claims**



1. A pregnancy-supporting lounge chair, comprising, in combination, a first seat frame including support legs connected thereto, a second seat frame pivotally connected to one end of said first seat frame, a combination head and backrest frame pivotally secured to the other end of said first seat frame, a footrest frame connected to said one end of said first seat frame, body support means mounted on each of said first seat frame, said second seat frame, said combination head and backrest frame and said footrest frame, the body support means on said first seat frame being discontinuous, thereby forming an opening, and a stretch band secured to said first seat frame to span said opening, whereby when said second seat frame is in a first position overlying the footrest frame, said stretch band supports a pregnant woman's stomach area comfortably when she lies in a face-down prone position upon said first seat frame, said combination head and backrest frame and said footrest frame, and said second seat frame can be pivoted to a second position overlying said first seat frame to support the woman comfortably in a sitting position.

4,508,385

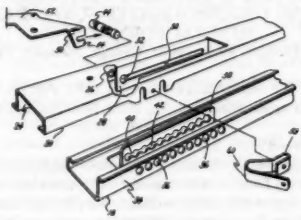
SEAT TRACK ASSEMBLY

James A. Bowman, Georgetown, Ky., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Apr. 7, 1982, Ser. No. 366,451

Int. Cl.³ B60N *1/04*

U.S. Cl. 297—341 **5 Claims**



1. A seat track assembly comprising an upper frame member adapted to be secured to a vehicle seat, a lower frame member adapted to be secured to the vehicle floor, said upper frame member being supported on said lower frame member for relative movement fore and aft of the vehicle, a first bracket on said upper frame member having a slot formed therein and an opening at one end of said slot, a second bracket on said lower frame member having a slot formed therein and a plurality of longitudinally spaced openings along said slot, said openings in said brackets having diameters substantially greater than the width of said slots, and a seat position control member supported on said frame members for movement in transverse directions between a locked position in which said seat position control member is secured to both said upper and lower frame members to prevent relative movement thereof, an indexing position in which said seat position control member is secured to said upper frame member but not to said lower frame member for relative movement to discrete positions with respect to said lower frame member, and a slide position in which said seat position control member is secured to said bottom frame member but not to said top frame member for relative movement of said top frame member on said bottom frame member within specified limits, said seat position control member having large diameter sections and small diameter sections, said large diameter sections being adapted to fit into said openings but not said slots, so that when said seat position control member is in said locked position, large diameter sections are received into openings on both said first and second bracket member, when said seat position control member is in said indexing position, a large diameter section is received into the opening on said first bracket member and a small diameter section is received into said slot on said second bracket member, and when said seat position control member is in said slide position, a large diameter section is received into one of the openings on said second bracket member and a small diameter section is received into the slot on said first bracket member.

4,508,386

ADJUSTABLE SEAT ASSEMBLY FOR MOTOR VEHICLES

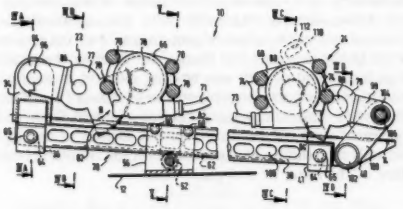
Hans-Otto Hofmann, Niederfüllbach, Fed. Rep. of Germany, assignor to Brose Fahrzeugteile GmbH & Co. Kommanditgesellschaft, Coburg, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,316

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1981, 3132235

Int. Cl.³ B60N *1/02*

U.S. Cl. 297—346 **14 Claims**



1. A seat assembly particularly for a motor vehicle including a vehicle frame and a vehicle seat comprising longitudinal seat adjustment means for adjustably moving said seat in longitudinal directions relative to said vehicle, tilt adjusting means for effecting height adjustment of said vehicle seat, and pin locking means operatively interposed between said vehicle frame and at least one of said longitudinal seat adjustment means and said tilt adjustment means capable of being selectively actuated to a locking position for locking said at least one of said longitudinal seat adjustment means and said tilt adjustment means, said longitudinal seat adjustment means comprising a longitudinally movable part having pin recesses therein, said pin

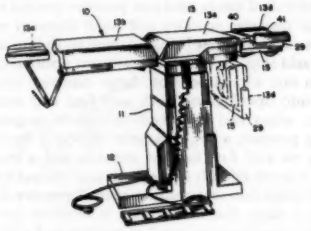
locking means including a plurality of pins arranged adjacent each other in the direction of movement of said moving part, said recesses having a width taken in said direction of movement which is equal to the sum of the respective width of two of said pins and one-third of the distance between the axial centers of said pins, the distance between the centers of adjacent recesses being equal to two-thirds of the distance between the pin axes.

4,508,387

LEG AND FOOT SUPPORT ASSEMBLY FOR MEDICAL EXAMINATION TABLE

Wilbur E. Gilbert; Robert E. Martin, and Donald P. Belonger, all of Two Rivers, Wis., assignors to Hamilton Industries, Inc., Two Rivers, Wis.

Filed Sep. 29, 1983, Ser. No. 537,341
Int. Cl.³ A47C 7/50
U.S. Cl. 297—429 **35 Claims**



1. A leg and foot support assembly for an adjustable table/-chair having a vertical movable seat section, said assembly comprising a frame having a proximal end adapted to be hingedly connected to the seat section of a table/chair for movement between raised and lowered positions; said frame including at least one vertical and longitudinal wall having first and second longitudinally-extending guide rails defining an elongated guide channel therebetween; a footrest extension having a member extending along said wall; said member having a pair of bearing elements adjacent the proximal end of said extension; one of said bearing elements being slidably retained in said guide channel for slidable and pivotal engagement with the inwardly-facing longitudinal surfaces of said rails defining said channel and the other of said bearing elements being slidably engagable with the outwardly-facing surfaces of said guide rails; and stop means blocking said guide channel at the proximal end thereof for limiting the extent of sliding movement of said one bearing element in a proximal direction and for permitting pivotal movement of said footrest extension to shift said second bearing element from sliding engagement with the outwardly-facing surface of one of said guide rails into sliding engagement with the outwardly-facing surface of the other of said guide rails.

4,508,388

HOIST CONTROL VALVE INTERLOCK SYSTEM FOR TROLLEY-ASSISTED DUMP TRUCKS

Teruo Minami, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 26, 1983, Ser. No. 498,287
Claims priority, application Japan, May 27, 1982, 57-088908
Int. Cl.³ B60P 1/16
U.S. Cl. 298—22 C **1 Claim**

1. A hoist control valve interlock system for use in a trolley-assisted dump truck, characterized in that said system comprises:

(a) a pantagraph power contactor which is installed in a main drive circuit of the dump truck and which is rendered ON when the trolley mode switch is turned on so as to drive the truck in a trolley mode condition;

(b) a generator power contactor which is installed in the main drive circuit and which is rendered OFF when said trolley mode switch is turned on;

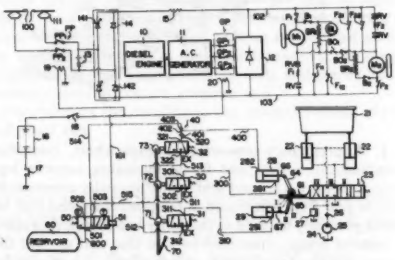
(c) a first air cylinder adapted to controllingly actuate a hoist control valve to both a floating position and a lowering position thereof, said hoist control valve being adapted to actuate hoist cylinders for a dump vessel;

(d) a second air cylinder adapted to controllingly actuate said hoist control valve to a raising position;

(e) an air reservoir for supplying compressed air into said air cylinders;

(f) a first air valve connected through a conduit with a lowering port of said first air cylinder to make the supply and discharge of the compressed air from said air reservoir;

(g) a second air valve connected through another conduit with a raising port of said second air cylinder to make the supply and discharge of the compressed air from said air reservoir;



(h) a shuttle valve which is provided in a conduit connected between the floating port of said first air cylinder and said air reservoir;

(i) a third air valve connected through the shuttle valve with the floating port of said first air cylinder;

(j) a trolley mode interlock valve which is provided in the conduit connected between said air reservoir and said valves and between said air reservoir and said shuttle valve, said trolley mode interlock valve being adapted to be switched from an engine mode position over to a trolley mode position; and

(k) a hoist control lever for controlling said first, second and third air valves; the arrangement being made such that when said trolley mode interlock valve is switched over to the trolley mode position, the compressed air from said air reservoir is supplied through said shuttle valve into the floating port of said first air cylinder irrespective of the position of said hoist control lever so that said hoist control valve is interlocked into the floating position thereof.

4,508,389

APPARATUS AND METHOD FOR HYDRAULICALLY MINING UNCONSOLIDATED SUBTERRANEAN MINERAL FORMATIONS

Everett L. Hodges, 49 Royal St. George, Newport Beach, Calif. 92660

Division of Ser. No. 243,819, Mar. 16, 1981, Pat. No. 4,405,176.
This application Sep. 12, 1983, Ser. No. 531,013
Int. Cl.³ E21C 45/00
U.S. Cl. 299—17 **13 Claims**

1. An improved hydraulic mining tool apparatus for recovering minerals from a subterranean deposit comprising:

a drill string positionable within a bore hole extending from ground surface into said subterranean deposit;

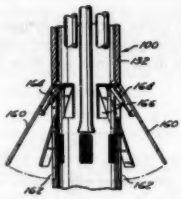
a mining tool mounted to said drill string and adapted to rotate within said subterranean deposit;

hydraulic cutting jet means located on said mining tool for dislodging said minerals from said subterranean deposit and forming a mineral bearing slurry;

pump means located on said mining tool for transporting said mineral bearing slurry to ground surface;

means carried by said mining tool for agitating said mineral bearing slurry to maintain said dislodged minerals in suspension witin said mineral bearing slurry, said agitating means comprising plural arm members extensible in a radial direction from said mining tool to be disposed in said mineral bearing slurry during rotation of said mining tool; and

means for rotating said plural arm members about their respective longitudinal axes.

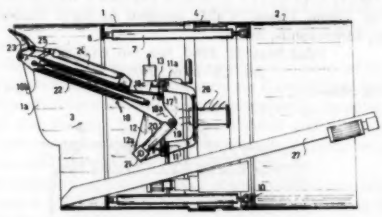


4,508,390

MACHINE FOR MAKING UNDERGROUND GALLERIES

Michel Bessac, Realmont, France, assignor to Foncages et Forages Bessac, S.A., Realmont, France

Filed Jun. 1, 1983, Ser. No. 500,413
Claims priority, application France, Jun. 2, 1982, 82 09835
Int. Cl.³ E21D 9/08
U.S. Cl. 299—33 **12 Claims**



1. A machine for making underground galleries comprising a hydraulic shield provided with a thrust ring (10) and a hydraulic thrust system (7), said shield comprising a knife casing (1) and an assembly skirt (2), each having a longitudinal axis and being moveable with respect to said each other, a digging device (3) housed within said knife casing, and slack fastener means (4, 5, 8, 9) for connecting said knife casing and said assembly skirt in such a manner as to permit pivotal motion of said knife casing and said assemly skirt about an axis orthogonal to said longitudinal axes whereby said longitudinal axes may form an adjustable angle therebetween.

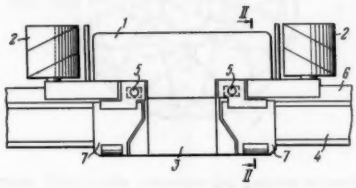
3. A machine as in claim 1, and wherein said slack fastener means comprises a plurality of coupling lugs (9) and traction studs (5) distributed around the shield, said lugs being linked to the front of said assembly skirt (2) and said studs being attached to the rear of the knife casing (1), each traction stud entering an aperture (9a) of a coupling lug (9) with a clearance designed to allow said relative pivoting motion between said knife casing and said assembly skirt.

4,508,391

MINING MACHINE FOR EXTRACTION OF MINERALS

Jury N. Spektor; Valery M. Gaponov, and Felix Z. Masovich, all of Moscow, U.S.S.R., assignors to Gosudarstvenny Proektno-Konstruktorsky I Experimentalny Institut Ugolnogo Mashinostroenia, Moscow, U.S.S.R.

Filed Oct. 19, 1982, Ser. No. 435,315
Int. Cl.³ E21C 27/24
U.S. Cl. 299—43 **1 Claim**



1. A mining machine for extraction of minerals from a face wherein a conveyor is installed, said machine comprising:

a body defining a first end and a second end;

a first and a second drum-type cutting head, each head mounted on one of said first and second ends of said body, respectively, said first and second drum-type cutting heads adapted for winning a seam of minerals and set to rotary motion;

a gantry mounted on said body above said conveyor;

two supports slidably mounted in said body for mounting the mining machine on the conveyor, each support having an adjustable hydraulic jack, each jack attached at one end to said body and slidably mounted in said support;

two grippers for coupling the mining machine to said conveyor and to retain said mining machine in place above the conveyor;

a first and a second set of levers, each set connecting one of said grippers to said body, and each set comprising two levers parallel to each other and positioned in such a way that one lever is located above the other lever, with both levers adapted to move the mining machine vertically in relation to said conveyor;

hinge joints, each hinge joint positioned for coupling said levers to said grippers and for coupling said levers to said body; and

a first link and a second link, one end of each link being rigidly connected to a different respectvie top lever and the other end of each link being rigidly connected to a different respective support to form a rigid linkage, including said body, levers and grippers, for locking the body of the mining machine in a vertical position, parallel to an original position, upon adjustment of said hydraulic jacks.

4,508,392

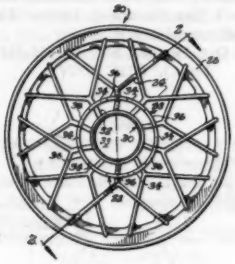
WHEEL HUB INCLUDING STRUCTURE FOR ATTACHMENT OF ACCESSORIES

Charles E. LeBlond, and Henri LeBlond, both of St. Bruno, Canada, assignors to Hamelin Industries, Inc., Boucherville, Canada

Filed Jun. 28, 1982, Ser. No. 393,069
Int. Cl.³ B60B 3/06, 5/02
U.S. Cl. 301—63 PW **21 Claims**

1. A one-piece integrally formed wheel hub including an improved structure integrally formed therewith for mounting at least one accessory having a portion of given outer diameter thereto, said improved structure comprising: radially acting coupling means including a plurality of axially directed alternating recesses and ridges about a periphery of said wheel hub for receiving complementary slots and projections on said

accessory for coupling said wheel hub and said accessory for rotation in unison and axially acting coupling means on said



wheel hub for holding said accessory substantially against axial movement relative to said wheel hub.

4,508,393

BRAKE-FORCE CONTROL FOR AT LEAST ONE AXLE OF A VEHICLE EQUIPPED WITH AN ANTI-LOCKING SYSTEM

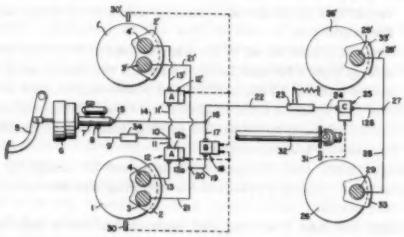
Klaus Drometer, Ostfildern, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 14, 1983, Ser. No. 458,049

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1982, 3201047

Int. Cl.³ B60T *8/04*

U.S. Cl. 303—111 **20 Claims**



1. A brake-force control for a vehicle equipped with an anti-locking system having at least a first axle with at least two wheels, first and second brake circuit means for each of said wheels of said first axle for controlling separate brake cylinders therefor, a first control channel means for controlling said first brake circuit means of each of said wheels as a function of the movement behaviour of said each wheel independent of movement of other wheels, further comprising:

a second control channel means for controlling in common said second brake circuit of each of said wheels of said first axle as a function of the movement behaviour of the said wheels of said first axle.

4,508,394

DRAWER GUIDE ASSEMBLY

Erich Röck, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Feb. 17, 1983, Ser. No. 467,224

Claims priority, application Austria, Feb. 17, 1982, 601/82

Int. Cl.³ F16C *29/04*; A47B *88/00*

U.S. Cl. 308—3.8 **4 Claims**

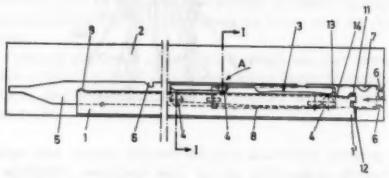
1. A drawer guide assembly for use on each of opposite sides of an article of furniture of the type wherein a drawer is slidably insertable into and removable from a furniture body, said assembly comprising:

a drawer side wall having therein a guide groove;

a roller carrier supporting rollers directly guided for longitudinal movement in said groove;

a support rail to be attached to a side of a furniture body into which is inserted the drawer, said support rail having a vertical flange and a horizontal flange extending from said vertical flange into said roller carrier and on which run said rollers;

whereby said roller carrier is longitudinally movable with respect to said groove and said support rail during movement of the drawer into and from the furniture body;



said groove having at an inner end thereof stop means for retaining said roller carrier in said groove upon complete removal of the drawer from the furniture body; and

said support rail having an inner end including means for preventing said roller carrier from moving therebeyond, said preventing means comprising a first stop bent outwardly and extending upwardly from said horizontal flange at a position to abut a first stop surface at a rear end of said roller carrier and a second stop bent outwardly and extending laterally from said vertical flange at a position to abut a second stop surface at said rear end of said roller carrier.

4,508,395

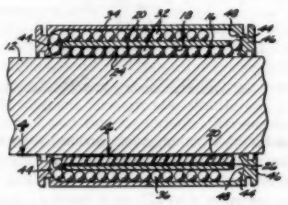
HIGH CAPACITY LINEAR ROTARY BEARING

Otto R. Heine, Poway, Calif., assignor to R&H Technology, Inc., Minneapolis, Minn.

Filed May 25, 1984, Ser. No. 614,262

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **20 Claims**



1. A linear rotary bearing, adapted to be mounted on a shaft, the bearing comprising:

a bearing race adapted to be mounted on the shaft in a concentric spaced relationship relative to said shaft;

a ball retainer mounted in a space formed between the bearing race and the shaft, the ball retainer forming a plurality of longitudinal ball channels substantially aligned with the longitudinal axis of the shaft;

a plurality of balls, and

an outer bearing housing fixedly mounted on the exterior of the bearing race, the housing in combination with the bearing race forming a plurality of longitudinal ball return channels substantially aligned with the longitudinal axis of

the shaft, the housing in combination with the bearing race further forming a substantially annular chamber at each end of the bearing, said annular chamber comprising means for the balls to pass from the ball return channels to the ball channels and from the ball channels to the ball return channels, the balls being disposed in the ball channels, in the ball return channels, and in the annular chamber, the number of the balls being such that a void space is available in the ball channels, ball return channels, and annular chamber, whereby during longitudinal movement of the bearing on the shaft the balls pass from the ball return channels to the ball channels and from the ball channels to the ball return channels in a substantially random manner to fill available space.

4,508,396

METHOD OF PRODUCING BEARING COMPONENT

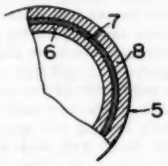
Motomichi Doi; Kinpei Okano; Katsutoshi Nii, all of Hitachi, and Yoshiharu Yokota, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,172

Claims priority, application Japan, May 22, 1981, 56-76607

Int. Cl.³ F16C *33/66, 33/00, 33/32;* C25D *5/50*

U.S. Cl. 384—463 **6 Claims**



1. A method of producing bearing components such as an inner ring, an outer ring, a rolling element and a shaft having a solid lubricant at a frictional surface part of a metal substrate constituting a bearing component, said method comprising the steps of:

providing an intermediate coating layer of a material having a substantially uniform thickness on the frictional surface part of said metal substrate by electroplating, the solubility of said material in the substrate metal and in the solid lubricant being higher than the mutual solubility between the substrate metal and the solid lubricant,

electroplating on a surface part of said intermediate coating layer a solid lubricant which has a substantially uniform thickness of 0.2–0.6 μm and which consists of an elemental metal having a lower solubility in said substrate metal, and

maintaining under a reducing atmosphere said solid lubricant, said coating layer and said metal substrate for a predetermined period of time at a predetermined temperature of below the lower one of the maximum operating temperature of the bearing component and the melting point of the solid lubricant to ensure that the elemental metal exists at a surface part of the solid lubricant layer and to induce mutal diffusion between the substrate metal, the coating material and the solid lubricant so that a part of the lubricant layer other than the surface part and the intermediate coating layer are alloyed with each other by said mutual diffusion, thereby increasing the bonding strength between the substrate metal, the coating material and the solid lubricant, the total thickness of the intermediate coating layer and the solid lubricant layer being 0.4–1.0 μm; and the heat treatment for diffusion being conducted with the bearing components assembled and with a powder of a nonmetallic solid lubricant placed between said assembled bearing components.

4,508,397

ANTI-FRICTION BEARING WITH ASSEMBLY FEATURE

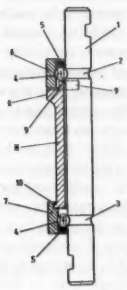
Heinrich Hofmann, Schweinfurt, and Dieter Treutlein, Grafenrheinfeld, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer Kommanditgesellschaft auf Aktien, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,889

Claims priority, application Fed. Rep. of Germany, May 17, 1982, 3218546

Int. Cl.³ F16C *19/02, 43/06*

U.S. Cl. 384—510 **12 Claims**



1. An anti-friction bearing comprising:

a shaft; two axially spaced apart raceways formed in the shaft; a respective outer race positioned proximate to and radially outside each raceway; the shaft being normally concentric with the outer races and being shiftable to be eccentric with respect to at least one outer race, whereby an enlarged space is opened between the one outer race and one lateral side of the shaft when the shaft is eccentric; a plurality of balls between each of the raceways and the respective outer race;

a bushing positioned between the two outer races; a shoulder having a wall portion formed on at least one end of the bushing and extending near the balls at that raceway at the one end of the bushing; the shoulder wrapping partially around the bushing; the shoulder being shaped and dimensioned for supporting the balls at the associated raceway and for preventing the balls from falling away from the raceway when the shaft is eccentric to the associated outer race and the shoulder is positioned beneath the enlarged space.

4,508,398

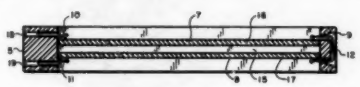
PRINTED CIRCUIT CONNECTING DEVICE

William E. Stepan, Clarendon Hills; Wayne E. Neese, Hoffman Estates; Thomas D. Belanger, Jr., Hinsdale, and Robert F. Janninck, Elmhurst, all of Ill., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Sep. 26, 1983, Ser. No. 536,074

Int. Cl.³ H01R *23/68*

U.S. Cl. 339—17 LM **4 Claims**



1. A device for mounting, interconnecting and terminating printed circuits comprising:

a frame of insulating material including first and second major sides and first and second minor sides;

mounting means integrally joined to an inner face of said first major side and said second major side, said mounting

means including a first planar surface arranged to accept and rest on said first planar surface a first removable component mounting surface having printed circuits affixed thereon and a second planar mounting surface arranged to accept and rest on said second planar surface a second removable component mounting surface having printed circuits affixed thereon;

a first plurality of terminal means each including a terminal connector engaging portion on an outer face of said first minor side for connecting to a source of input/output signals and contact portions extending from an opposite face of said first minor side, each of said contact portions communicating with an associated circuit of said first removable component mounting surface;

a second plurality of terminal means each including a terminal connector engaging portion on an outer face of said first minor side for connecting to a source of input/output signals and contact portions extending from an opposite face of said first minor side, each of said contact portions communicating with an associated printed circuit of said second removable component mounting surface;

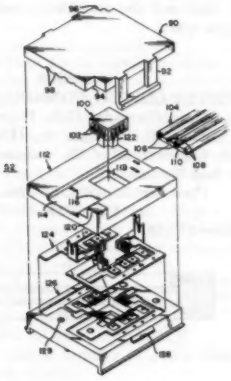
a plurality of openings extending through said second minor side, said openings arranged to accept a plurality of electrically conductive U-shaped members, each U-shaped member arranged to be accepted within one of said second minor side openings with a first leg of said U-shaped member contacting a printed circuit of said first removable component mounting surface and a second leg contacting a printed circuit of said second removable component mounting surface whereby, said U-shaped members electrically connect the printed circuits of said first removable component mounting surface to the printed circuits of said second removable component mounting surface and mechanically retain said first and second removable component mounting surfaces to said frame.

4,508,399

POLARIZED RIBBON CABLE CONNECTOR HAVING CIRCUIT COMPONENTS THEREIN

Edward C. Dowling, Harrisburg, and Jon A. Fortuna, New Cumberland, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 3, 1984, Ser. No. 567,458
Int. Cl.³ H05K *1/00*
U.S. Cl. 339—17 CF **9 Claims**



1. A cable connector having circuit components therein, comprising:

a housing top assembly having a profiled area to receive an electrical cable and having at least two latch members attached thereto;

an electrical cable having a plurality of wires therein disposed adjacent to said profiled area;

a housing intermediate assembly adjacent the top assembly and having a cable receiving channel therein, said channel in opposing relationship to said profiled area in said top assembly, said intermediate assembly further having contact receiving apertures therethrough;

a logic package having electrical components contained therein and conductive pads disposed on the outside thereof wherein said pads are electrically connected to said components;

a connector carrier strip adjacent to said intermediate assembly, said strip being characterized in that: said strip has a plurality of terminals bent up from the plane defined by said strip, said terminals cooperating with said apertures in said intermediate assembly and extending therethrough so as to have each of said terminals engage a wire in said cable, further characterized in that a plurality of contact legs are bent down from the plane defined by said strip, said legs facilitating electrical communication with said logic package and being further characterized in that pin apertures are disposed in said strip which allow for electrically conductive pins to be disposed therethrough and thereby in electrical communication with said logic package and/or said wires in said cable; and

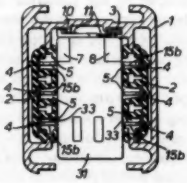
a housing lower assembly adjacent to said strip, profiled to receive said strip and having a lower assembly aperture therein profiled to receive said contact legs and said logic package, said lower assembly having lower assembly pin apertures therethrough which are aligned and cooperate with said pin apertures in said strip and said electrically conductive pins and further having retaining tabs cooperable with said latch members contained on said top assembly thereby fixedly holding said upper, intermediate and lower assemblies along with said strip and said cable together, thereby forming an active connector assembly.

4,508,400

ELECTRICAL SUPPLY CONNECTOR FOR CONTINUOUS OUTLET TRACK

Tony E. G. Herbert, East Sussex, England, assignor to Rotaflex p.l.c., London, England

Filed Oct. 18, 1982, Ser. No. 434,732
Int. Cl.³ H01R *25/14*
U.S. Cl. 339—22 R **11 Claims**



1. A supply connector for connecting to a source of electrical current the conductors of a current distribution track member having an elongate channel housing a plurality of conductors extending longitudinally of the channel, the connector comprising a generally rectangular housing, a plurality of terminals mounted in the housing for connection of electric current supply leads, a plurality of resilient elongate electrical contacts mounted to extend generally in parallel and longitudinally of the housing, each contact having one end connected to one of the terminals and the other end arranged to protrude laterally through an opening in a side wall of the housing for engaging a respective conductor of the track member, and each contact being mounted in cantilever manner adjacent said one end to enable the other free end thereof to move between a retracted position within the housing and an operative posi-

tion projecting through the housing opening, said free ends being yieldably urged toward said operative position by the resilience of said contacts, said one end of each said contact being mounted in closer proximity to said side wall than to the opposite housing side wall, a cam member slidable longitudinally in the housing and arranged to cooperate with the contacts for shifting said free ends of said contacts from said operative to said retracted position, and drive means coupled to the cam member for displacing the cam member longitudinally of the housing and the contacts, said drive means including an operating member movably mounted to the housing and operable either to retract the contacts, thereby to enable the connector to be inserted into the track channel through the mouth thereof, or to release the contacts into their operative positions for engaging the track conductors, the connector being supported by and accommodated substantially within the track member with the longitudinal axes of the track member and housing being substantially parallel when the contacts are engaged with the track conductors.

4,508,401

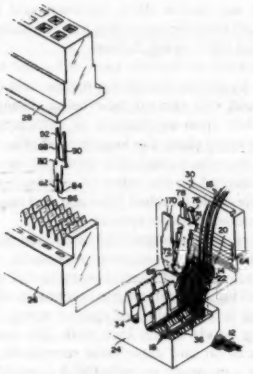
WOVEN CABLE CONNECTOR

Albert Casciotti, Hershey; Earl W. McCleerey, and Pete Cosmos, both of Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 18, 1983, Ser. No. 495,879

Int. Cl.³ H01R *4/66, 11/20, 43/04*

U.S. Cl. 339—14 R **16 Claims**



1. A method for terminating multi-conductor woven cable in an electrical connector of the type wherein a plurality of ground and signal conductors are secured in parallel spaced relationship in a patterned array in a woven cloth base, portions of the cable being so formed as to have the conductors loose from one or both sides of the base, said method comprising the steps of:

feeding a free end of the cable to a base member of said electrical connector and disposing said ground conductors in respective ones of a plurality of channels of said base member;

applying a plurality of first terminals to said base member, each said first terminal engaging and securing at least one ground conductor in a respective channel, each of said first terminals having arms which can be selectively bent;

applying intermediate member having a first face engaging said base member and a profiled oppositely directed second face; disposing said signal conductors on the profile face of said intermediate member; and

applying to said sub-assembly of said base and intermediate member a mating member carrying a plurality of second terminals which selectively make contact with respective signal conductors and the arms of said first terminals whereby both said signal conductors and ground conductors are terminated and ground of the connector is programmed.

5. An electrical connector for terminating multi-conductor woven cable of the type wherein a plurality of ground and signal conductors are secured in parallel spaced relationship in a patterned array in a woven cloth base, portions of the cable being so formed as to have the conductors loose from one or both sides of the base, said connector comprising:

an elongated base member of rigid insulative material defining an elongated cable receiving slot and a plurality of ground wire receiving channels extending normal to said slot along a first surface, and at least one terminal receiving recess in said base member intersecting each said channel;

an elongated intermediate member having oppositely directed profiled first and second surfaces and a plurality of terminal passages extending between said surfaces;

an elongated mating member of rigid insulative material having a mating face and an oppositely directed surface with a plurality of terminal passages extending between said face and said surface;

at least one first terminal received in said terminal receiving recess of said base member and engaging and securing at least one ground conductor in each said channel each said at least one first terminal having an integral deformable extension; and

a plurality of second terminals each received in a respective passage of said mating member with a mating portion directed toward said mating face and a signal conductor engaging portion depending from said surface to engage a signal conductor on said intermediate member and said deformable extension of said at least one first terminal being bent to selectively engage a second terminal thereby programming ground for said connector.

4,508,402

INTEGRATED CIRCUIT PACKAGE AND DISPLAY PANEL

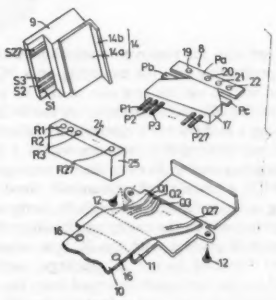
Tadashi Tomino, Yamatokoriyama, and Masayuki Higuchi, Ueno, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 18, 1982, Ser. No. 349,925

Claims priority, application Japan, Feb. 27, 1981, 56-29250; Apr. 9, 1981, 56-54066; Sep. 30, 1981, 56-157151

Int. Cl.³ H05K *11/00*

U.S. Cl. 339—17 CF **2 Claims**



1. A calculator assembly comprising:

an integrated circuit element having a power terminal at one periphery thereof including a plurality of positioning apertures therein and a plurality of signal terminals opposite said power terminal at a second periphery thereof;

a circuit board having a plurality of terminals to be electrically connected respectively to said terminals of said

integrated circuit element and having a plurality of positioning apertures therein;

a casing within which said integrated circuit element and said circuit board are securely fixed, said casing having a plurality of positioning projections to be received by said positioning apertures in said integrated circuit element and a plurality of positioning projections to be received by said positioning apertures in said circuit board, for determining the relative position of said integrated circuit element and said circuit board with respect to said casing;

a display panel having a plurality of terminals to be electrically connected to said terminals of said integrated circuit element and held between said integrated circuit element and said casing; and

a keyboard having key conductors disposed on said circuit board and actuators held in said casing, said keyboard having a plurality of terminals to be connected to said terminals of said integrated circuit element,

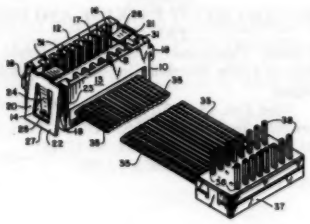
such that said terminals of said integrated circuit element are electrically connected to said terminals on said circuit board, said terminals of said display panel and said terminals of said keyboard and are prevented from shifting from said connections by said projections received within said apertures in said integrated circuit element and said apertures in said circuit board said terminals of said display panel being electrically connected to said terminals of said integrated circuit element by an elastic body around which one end of said circuit board is wound.

4,508,403

LOW PROFILE IC TEST CLIP

David Weitman, Millwood, and Pyotr Tsipenyuk, Bronx, both of N.Y., assignors to O.K. Industries Inc., New York, N.Y.

Filed Nov. 21, 1983, Ser. No. 553,853
Int. Cl.³ H01R *13/639*
U.S. Cl. 339—28 **13 Claims**



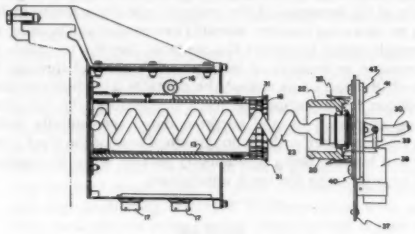
1. A test clip for removable attachment to an IC package having protruding pins for mounting on a PCB, for providing electrical access via the test clip to the IC pins for electrical testing of the IC while mounted on the PCB and in service, comprising a shallow body comprised of electrically insulating material and having side surfaces and at a bottom surface a cavity dimensioned to fit over the IC package while mounted on the PCB, a plurality of substantially fixed clip contact pins of spring metal extending through the body and having lower ends exposed within the cavity and positioned to make respective electrical contact with the IC pins when the clip is slid over and attached to the IC package, user-actuable means mounted on the body and separated from the clip contact pins for selectively locking and unlocking the clip to and from the IC package, said locking means being positioned to avoid contact with the IC pins when the clip is attached to the IC, and a flat multi-conductor cable connected to and extending laterally outwardly from a side surface of the body and having its conductors connected within the body to respective clip contact pins, said cable having at its free end means by which electrical access may be had to the IC pins via the cable conductors and clip contacts.

4,508,404

REMOTE CONNECT AND DISCONNECT ASSEMBLY WITH ENERGY ISOLATION

Norman E. Frawley, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Nov. 23, 1981, Ser. No. 323,850
Int. Cl.³ H01R *13/629*
U.S. Cl. 339—45 M **14 Claims**



7. An apparatus for providing electrical connection, disconnection, and reconnection between two proximate but spaced apart bodies, while minimizing the transfer of energy from one body to the other, comprising:

an extendable and retractable member comprising a first tube fixed to one of said bodies, a second tube, slideably mounted to said first tube in telescoping fashion, and a rack and pinion drive between said first tube and said second tube for extending and retracting said second tube in said telescoping fashion;

a detachable receptacle carried by and held to said second tube by a biased retaining means, said detachable receptaclè and said second tube being disengageable from one another upon application of sufficient force and movement apart along the longitudinal axis of said second tube;

a fixed receptacle, mateable with said detachable receptacle, and located on the other of said bodies;

a flexible cable attached between said one of said bodies and said detachable receptacle; and

a locking means associated with said fixed receptacle for locking said detachable receptacle when in making contact with said fixed receptacle and upon command, for unlocking said detachable receptacle wherein said locking means is a plurality of spaced apart, circularly located, spring pawls which lock with like spaced apart stepped surfaces on said detachable receptacle, said spring pawls being commonly mounted to a rotatable base for unlocking whereby upon extension of said second tube said detachable receptacle will be carried and locked into mating contact with said fixed receptacle, said biased retaining means allowing retraction of said second tube thereby leaving said first and second body in electrical connection through said flexible cable, and upon reextension of said second tube and upon rotation of said rotatable base, said detachable receptacle may be disconnected from said fixed receptacle by reengagement of said detachable receptacle with said second tube through said biased retaining means and retraction of said second tube.

4,508,405

ELECTRONIC SOCKET HAVING SPRING PROBE CONTACTS

Neil F. Damon, Ft. Pierce, Fla., and Frank C. Rydwansky, Jr., Quincy, Mass., assignors to Augat Inc., Mansfield, Mass.

Filed Apr. 29, 1982, Ser. No. 373,215
Int. Cl.³ H01R *9/09*
U.S. Cl. 339—75 MP **14 Claims**

1. An electronic component socket comprising:

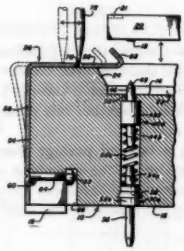
a body of electrically insulative material having first and second opposed surfaces, with said second surface having a recess adapted to receive said electronic component;

said body having an array of parallel passages of a first diameter extending from the first surface into the body and having an array of openings of a second diameter extending from the second surface into the body corresponding ones of which are communicating with a respective passage and being of smaller second diameter than the first diameter of the respective passage;

means adjacent the recess of the second surface of the body defining locating surfaces operative to laterally position the component received in the recess of the second surface;

a plurality of spring probe assemblies individually disposed in a respective passage and its communicating opening and each including:

a first electrically conductive member having means for



retaining the member in the corresponding passage, and a lead outwardly extending from the first surface of the body;

a second electrically conductive member slidably disposed in the passage and having a contact portion confronting a corresponding one of said openings;

an electrically conductive coil spring connected between the first and second conductive members and operative to urge the second member to an outer position with the contact portion in alignment with the corresponding opening;

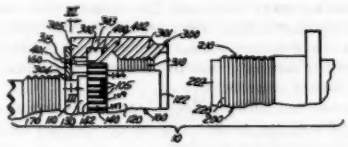
retaining means attached to the body and being movable to an open position to permit reception of the electronic component in the recess of the second surface and being moveable to a closed position to removably retain the component received on the second surface of the body.

4,508,406

ELECTRICAL CONNECTOR ASSEMBLY HAVING AN ANTI-DECOUPLING DEVICE

Robert W. Brush, Sr., Unadilla, and Dee A. Werth, Afton, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed Sep. 30, 1982, Ser. No. 431,971
Int. Cl.³ H01R *13/623*
U.S. Cl. 339—89 M **13 Claims**



1. An electrical connector assembly having an anti-decoupling device comprising: first and second shells, one of said shells including on an outside portion thereof a plurality of radially extending ratchet teeth, said ratchet teeth forming a contiguous succession of peaks and valleys between, respectively, first and second cam faces; a coupling nut mounted for rotation to the first shell for connecting to the second shell and coupling the first and second shells together; and an anti-decoupling device for retarding rotational movement of the coupling nut relative to the first and second shells, said anti-decoupling device characterized by;

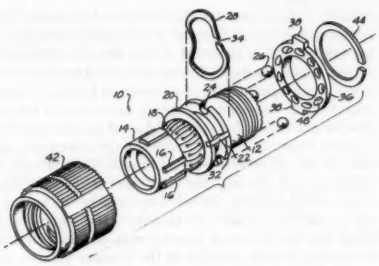
an elongated spring arm having its axis extending generally in the direction of the connector axis one end thereof being secured to the inside of the coupling nut and its other end extending therefrom and disposed in one said valley, said spring arm being constrained to rotate with said coupling nut and resiliently deflectable in a radial direction relative to its securement and said other end being adapted to radially deflect and advance from one to another of said valleys, rotation of the coupling nut forcing the other end of the spring arm against one of said cam faces, the cam face camming the other end radially upwardly from the one valley and over the peak associated therewith and into the next successive valley, rotational engagement of the spring arm with the ratchet teeth faces retarding rotational movement.

4,508,407

SELF-LOCKING CONNECTOR

David J. Ball, Encino, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Dec. 2, 1982, Ser. No. 446,120
Int. Cl.³ H01R *13/54*
U.S. Cl. 339—89 R **8 Claims**



1. A plug connector member adapted to mate with a receptacle connector member comprising:

a barrel having a coupling ring rotatable thereon;

locking means operative between said coupling ring and said barrel to prevent relative rotation thereof;

said locking means comprising an annular element having a plurality of circumferentially spaced detent recesses therein and a locking element having a plurality of detent projections thereon facing said recesses;

one of said elements being fixed against rotation on said barrel and the other element being rotatable with said coupling ring;

means biasing said projections and recesses toward each other; and

said recesses and projections being arranged whereby only one projection may engage a recess at any given relative position of said annular and locking elements so that a large number of locking positions is provided.

4,508,408

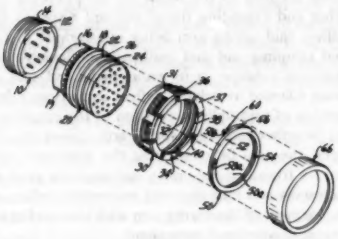
ANTI-DECOUPLING MECHANISM FOR AN ELECTRICAL CONNECTOR ASSEMBLY

Eric F. Shepler, Sidney, and Anthony W. Knapp, Laurens, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed May 11, 1983, Ser. No. 493,496

Int. Cl.³ H01R *13/623*

U.S. Cl. 339—89 M **5 Claims**



1. An anti-decoupling mechanism for an electrical connector assembly, the connector assembly having a primary axis and comprising a pair of connector members and a coupling nut including a radial flange rotatably mounted to one of said connector members for coupling to the other connector member, said one connector member including an annular groove having a forwardly facing end wall and said radial flange having a rearwardly facing outer end wall, said anti-decoupling mechanism being adapted to resist both coupling and uncoupling rotation of the coupling nut and characterized by:

a plurality of detents disposed around said outer end wall, each said detent including a pair of angularly spaced sidewalls with one of said sidewalls being generally radially disposed and the other of said sidewalls being skewed and acutely-angled relative to a radius drawn through the primary axis; and

a radially expansible/contractible annular spring interference fit within said annular groove and including a locking tab releasably disposed within one of said detents, the spring annulus being adapted to expand/contract, respectively, upon application of an external torque, the interference fitment between the spring annulus and the annular groove providing frictional forces of an amount sufficient to resist unwanted relative rotation therebetween, application of an external coupling/uncoupling torque to the coupling nut driving one and the other said sidewall, respectively, against the tab and causing the spring annulus to radially expand or contract, the radial expansion reducing the frictional interference forces and allowing the spring to slide relative to the annular groove, and the radial contraction initially increasing the frictional interference forces preventing relative rotation until sufficient external torque cams the tab radially upward on the sidewall and outward of its detent and the spring annulus expands whereby the coupling nut rotates and advances the next successive detent into engagement with the tab whereupon the spring radially contracts into its interference fit within the annular groove.

4,508,409

INSULATION PIERCING COAXIAL GRIP SPLICE DEVICE

Hitesh Cherry, Harrisburg, and Walter M. Werner, Downington, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

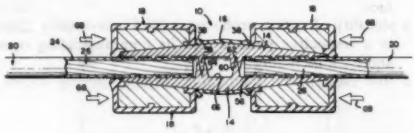
Filed Jun. 28, 1983, Ser. No. 508,648

Int. Cl.³ H01R *11/20, 4/50*

U.S. Cl. 339—97 R **5 Claims**

1. An insulation piercing, coaxial grip splice device comprising:

a. an elongated body having a tapered outer surface converging from a common midpoint toward each end, a passage therethrough with insulation piercing teeth positioned on the walls defining the passage and extending inwardly, said teeth being adapted to be driven into insulation covered cable which may be positioned in the passage, said body being formed from a pair of elongated shells having concave surfaces cooperating to form the passage when mated with one concave surface having a



rib positioned normal to the longitudinal axis and midway between the ends and the other concave surface having a groove positioned to receive the rib to frictionally hold the assembled shells together in a predetermined, spaced-apart relation; and

b. collars having a tapered passage therethrough slidably mounted on each end of the assembled, spaced-apart shells and adapted to compress the shells towards each other by being driven up the tapered outer surface.

4,508,410

ELECTRICAL TERMINATION SYSTEM AND CONNECTOR MEMBER

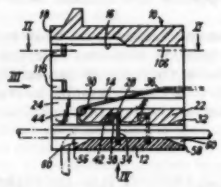
Kevin Canham, Newmarket, England, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 17, 1982, Ser. No. 442,335

Claims priority, application United Kingdom, Dec. 1, 1981, 8136246

Int. Cl.³ H01R *13/38*

U.S. Cl. 339—99 R **13 Claims**



1. A termination system for electrical conductors comprising:

a first insulative member including a wall member having a first surface, said first surface having recesses adjacent an edge of the wall member;

a plurality of conductive insulation—displacement contacts extending away from said first surface, each insulation displacement contact being provided at the first end portion of a respective contact member which is formed from a strip or sheet or conductive material, said contact member further comprising:

at a second end portion a flexible contact for making disconnectable sliding contact with another contact member of another connector member;

a first bent portion adjacent said first end portion and bent to be accommodated in a respective one of said recesses in said wall member; and

a second bent portion between said first bent portion and said second end portion, said second bent portion being bent through an angle of between 90° and 180° and closely conforming around said edge of said wall member;

a second insulative member adapted to be opposed against said first surface on said first insulative member;

a second surface on said second insulative member and facing said first surface when said members are opposed to each other;

said first and second members being relatively moveable towards one another such that conductors located across said second surface on said second member can be forced into said insulation-displacement contacts on said first member; and

means provided on said second member on opposed edge portions of said second surface and being capable of receiving, gripping and retaining conductors lying across said second surface prior to engagement with said contacts.

4,508,411

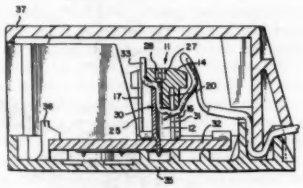
WIRE STUFFING COVER

Richard L. Hughes, and Ned A. Sigmon, both of Clemmons, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 29, 1983, Ser. No. 480,044

Int. Cl.[3] **H01R** *11/20, 13/58*

U.S. Cl. 339—99 R **9 Claims**



1. A molded one piece resilient plastic cover for a tubular terminal having but one axially extending wire receiving slot comprises a socket profiled to closely receive the terminal, the socket having a blind end adjacent a first face of the cover and an opposed open end at a second, terminal receiving face of the cover, the cover having opposed front and rear faces extending between the first and second faces, an axially extending wire gripping slot in a socket wall at the front face and opening on the terminal receiving face, and a stuffer extending axially from the blind end of the socket for engagement with a wire when the cover is applied to a terminal, characterized by

a second axially extending wire gripping slot formed in a socket wall at the rear face of the cover and opening on the terminal receiving face, the slot extending above the terminal when the cover is fully applied thereto,

a wire lead-out opening communicating between the blind end of the socket behind the stuffer and the second axially extending wire gripping slot where it extends above the terminal when the cover is fully applied,

the stuffer being profiled to permit the wire to be drawn into the terminal behind the stuffer as the cover is applied to the terminal to force the wire into the wire receiving slot thereof, whereby

the wire will extend through the lead-out opening and out of the second wire gripping slot when the cover is fully applied.

4,508,412

FUSE HOLDER

Charles W. Daggett, Mt. Prospect, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

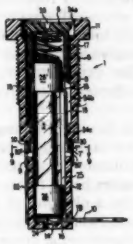
Filed Mar. 8, 1982, Ser. No. 355,907

Int. Cl.[3] **H01R** *13/68;* **H02B** *1/02*

U.S. Cl. 339—126 R **25 Claims**

8. In a fuse holder for cartridge type electrical fuses having end terminals and comprising an insulated fuse holder body having a central first passage for accepting an inserted fuse, end terminal contacting means disposed at the rear or interior end of said passage for making an electrical contact to the inserted first end of said fuse and providing a conducting path therefrom for lead attachment outside said fuse holder body, a knob assembly comprising an insulating knob carrying a conducting sleeve therein configured to engage and electrically contact the front or opposite end of said fuse, said knob, said sleeve and said first passage configured such that said sleeve and portions of said knob can be insertingly accepted by said body to capture said fuse between said sleeve and said end contacting terminal means, and retention means for holding said knob assembly in place after the insertion of said sleeve and said fuse in said first passage, the improvement comprising:

an electrically conducting one-piece side terminal mounted



on the outside of said body, said body being configured with unitary complementary anchoring portions to secure said side terminal to said body by snap-in engagement thereof, said fuse holder body having at least a pair of side passages oppositely disposed about the axis of said first passage and passing from the outside of said fuse holder body to said first passage, said side terminal being configured with at least a pair of inwardly projecting contacting means disposed to project inwardly into said side passagese, and said sleeve includes at least a pair of engaging means disposed to pressingly contact said inwardly projecting contacting means through said side passages when said sleeve of said knob assembly is inserted into said body, and retained by said retention means.

4,508,413

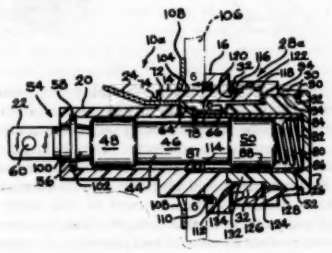
CONNECTOR

William R. Bailey, Villa Park, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 12, 1982, Ser. No. 367,651

Int. Cl.[3] **H01H** *85/50;* **H01R** *13/68*

U.S. Cl. 339—129 **7 Claims**



1. A fuseholder, comprising:

a body portion, said body portion being adapted to contain at least a portion of a generally cylindrical fuse member, said fuse member having a body portion and first and second end cap portions at opposite ends thereof;

said body portion including at a first end thereof a contact member adapted to contact said first end cap portion of

said fuse member, said contact member extending the exterior of said first end of said body portion and including a connection portion adapted to receive an electrical connection thereto;

a cap portion for retaining said fuse member in said fuseholder, said cap portion including means for retaining said second end cap portion of said fuse member and resilient means adapted to contact said second end cap portion to urge said fuse member towards said contact member when said cap portion is joined to said body portion

said means for retaining said second end cap portion being a tubular member protruding from an end thereof and adapted to be inserted into said body portion;

said body portion including a second contact portion adapted to frictionally received said tubular member and to establish electrical connection thereto, said second contact postion including a generally ring-shaped portion adapted to receive said tubular portion and a second connection portion extending to the exterior of said body portion and adapted to receive an electrical connection thereto;

said cap member having a joining member for joining said cap portion to said body portion, said joining portion being freely rotatably mounted to said cap member;

said joining member being freely rotatably mounted to said cap member by a plurality of resilient mounting fingers integral with said joining member and adapted to cooperate with a circumferential groove of said cap member, said cap member defining said groove in an outer surface thereof;

said body portion including means adapted to cooperate with said joining member for joining said cap portion to said body portion, and establishing an electrical current path from said second end cap portion through said tubular member and said resilient means to said generally ring-shaped portion and said second connection portion.

4,508,414

SHIELDED CABLE-CONNECTOR ASSEMBLY

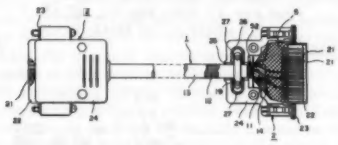
Akio Kusui; Shuji Morita; Toshio Kudoh, all of Hyogo; Yasuo Tanaka, Saitama, and Hirotaka Itoh, Osaka, all of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki, Japan

Filed Oct. 18, 1982, Ser. No. 434,866

Claims priority, application Japan, Oct. 30, 1981, 56-175089; Dec. 29, 1981, 56-211630

Int. Cl.³ H01R *13/658*

U.S. Cl. 339—143 R **7 Claims**



1. A shielded cable-connector assembly, comprising: a multicore cable (1) including a plurality of conductor cores (11) and a shielding member (12) enclosing said cable conductor cores in a shielding manner, a connector (2) including a plurality of mutually insulated contact elements (21) and a metallic contact cover (22) enclosing said plurality of contact elements in an electrically insulating manner, each of said cable conductor cores of said multicore cable being electrically connected to its respective contact element of said plurality of contact elements in a connecting portion, shielding means comprising an initially flexible thin sheet of expanded metal having fine apertures and surrounding said connecting zone in an insulating manner, means electrically connecting said thin sheet of expanded metal to said metallic contact cover (22) and to said shielding member (12) of said multicore cable, and molded protective outer cover means (9, 24) made of a moldable material integrally molded onto said initially flexible thin sheet of expanded metal in a molding operation causing said moldable material to enter into said fine apertures of said initially flexible thin sheet of expanded metal, whereby said initially flexible thin sheet of expanded metal is reinforced by said moldable material when the moldable material has hardened and filled said fine apertures, said protective outer cover means covering an end portion of said multicore cable at its connector side.

4,508,415

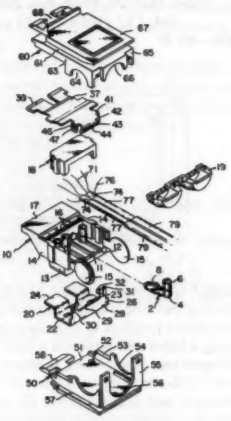
SHIELDED ELECTRICAL CONNECTOR FOR FLAT CABLE

Edward D. Bunnell, Palm Harbor, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 29, 1983, Ser. No. 518,503

Int. Cl.³ H01R *13/648*

U.S. Cl. 339—143 R **4 Claims**



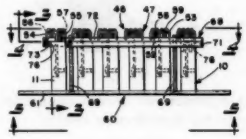
1. An electrical connector for shielded multiconductor flat cable having a drain wire associated with the cable shield, said connector being of the type comprising an insulating housing having a mating face, an opposed conductor receiving face, a plurality of terminals in the housing with resilient contact portions toward the mating face and wire connecting portions toward the wire receiving face, and a connector shield having a cable gripping portion and a contact portion, characterized in that said connector is adapted for use with a flat multiconductor cable having a planar array of shielded signal conductors, said connector shield comprising a bottom shield member assembled to said connector before terminating said signal conductors and a top shield member assembled to said connector after terminating said signal conductors, each said shield member being stamped and formed from one piece with a panel substantially parallel to the cable, a contact portion at the end of the panel toward the mating face, and a cable gripping portion toward the conductor receiving face, said cable gripping portion comprising a flange extending obliquely of said panel and contacting the portion of said cable adjacent said flange, said shield members having cooperating latching means so that the top shield member can be latched to the bottom shield member with the connector shield substantially surrounding a flat cable with said portion of said cable sandwiched between the opposed flanges, said latching means on said bottom shield member comprising an upstanding tab adjacent said cable, said tab having a slot therein profiled to receive said drain wire.

4,508,416

MULTIPLE THERMOCOUPLE CONNECTOR PANEL

Glen F. Oftedahl, Antioch, Ill., assignor to Pneumo Corporation, Boston, Mass.

Filed Apr. 2, 1982, Ser. No. 364,995
Int. Cl.³ H01R *13/50*
U.S. Cl. 339—176 M **11 Claims**



1. A multiple connector panel assembly comprising a faceplate, a plurality of connectors each of the type including a housing of insulating material having two longitudinally extending sockets, and two terminals respectively received in said sockets, each terminal having its front end adapted for electrical contact with a corresponding terminal of a mating connector and its rear end extending short of the rear of said housing, mounting means for mounting said connectors to the rear of said faceplate in generally parallel, laterally disposed relationship, and a terminal extender for each terminal, said terminal extender being connected at its front end to the rear end of the respective terminal and extending beyond the rear of said housing to provide for connection of a lead wire thereto, said mounting means including a mounting plate spaced from said faceplate, and means for securing said mounting plate to said faceplate with said connector housings held therebetween and said terminal extenders extending beyond the rear of said mounting plate, said mounting plate having a plurality of openings, and each terminal extender of said connectors extending through a respective one of said openings beyond the rear of said mounting plate, each terminal extender having a rear end closely accommodated in and transversely located by the respective one of said openings in said mounting plate, said mounting plate being made of insulating material and having portions mutually insulating the rear ends of adjacent terminal extenders, each terminal extender having a flat main portion bent transversely at its rear end to form a web portion and then forwardly to form a side flange, said side flange and the coextensive part of said main portion engaging opposite sides of the respective one of said openings to transversely locate the rear end of the terminal extender.

4,508,417

PLUG-IN WIRE TERMINAL SYSTEM

F. Wolfgang Bienwald, Melville, N.Y., assignor to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Filed Apr. 11, 1983, Ser. No. 483,794
Int. Cl.³ H01R *17/04*
U.S. Cl. 339—176 L **7 Claims**

1. A plug-in terminal system, in combination, comprising:

a body forming an approximately cylindrical socket having an end wall and an opposed open side, said end wall forming first and second passages extending between the inner and outer surfaces of said end wall,

screw shell means mounted in said socket for receiving the base of an incandescent lamp and for providing an electrical connection to said base,

bushing means mounted in said first passage,

first and second insulated wire conductors having respective first and second leads,

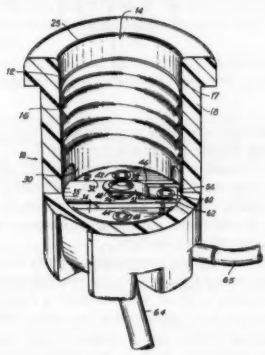
terminal means positoned in said bushing means, said bushing means being for permanently receiving and permanently holding said terminal means when said terminal means is plugged into said bushing means, said terminal means being for gripping said first lead and electrically connecting said first lead to said bushing means, said bushing means also being for electrically connecting said terminal means to said shell means, and

electrical contact means in association with said second passage for providing an electrical connection between said second lead and said base of said base of said lamp,

said first passage being counterboard from said outer surface of said end wall forming an annular stop ledge within said first passage, said bushing means including a bushing body having an external annular flange stop, said bushing body being positioned within said first passage, said flange stop being in contact with said ledge,

said bushing body forming a central hollow core having an inner and an outer rim; and wherein said shell means includes a shell flange coextensive with a portion of said inner surface of said end wall, said shell flange forming a hole coextensive with said first passage, said inner rim of said core being engaged with said shell flange at said hole, whereby an electrical connection is made between said shell means and said bushing,

said inner rim including an annular flared head having an annular edge in pressing contact with said shell flange, whereby said bushing is locked from moving outwardly in



said first passage, and whereby said annular edge is in electrical connection with said shell flange,

said hollow core of said bushing body including an inner core portion associated with said inner rim, said inner core portion having an inner diameter, a middle core portion connected to said inner core portion having a middle diameter, and an outer core portion connected to said middle core portion having an outer diameter, said middle diameter being smaller than said inner and outer diameters, an annular, shoulder being formed between said inner and middle core portion, and an annular sloped guide being formed between said middle and outer core portions,

said terminal means including a terminal element permanently positioned within said hollow core of said bushing body,

said terminal element including an elongated spine having opposed end portions, said terminal element including a first sleeve connected to one of said portions and a second sleeve connected to said spine spaced proximate to said first sleeve, the insulation of said first lead being positioned within and gripped by said first sleeve and the wire of said first lead being positioned within and gripped by said second sleeve,

said terminal element further including a substantially annular contact portion connected to said spine proximate to

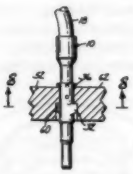
said second sleeve, said contact portion being movable from an outward unbiased position to an inward biased position, said contact portion being positioned in biased contact with the inner surface of said middle core portion of said bushing body; whereby said contact portion is moved between said unbiased position to said biased position during the movement of said contact portion from said outer core portion along said sloped guide to said middle core portion, electrical contact is made between said terminal element and said bushing body, and said contact portion inhibits the movement of said terminal body inwardly toward said socket.

4,508,418

RELEASABLE POSITION-LOCKING CONNECTOR ASSEMBLY

Donald J. Gagne, St. Paul, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 15, 1983, Ser. No. 523,519
Int. Cl.³ H01R 4/48
U.S. Cl. 339—253 R **3 Claims**



1. A connector assembly comprising a male pin connector and a matable female receptacle connector,

said male connector having a shank having an axis, and lock means supported by said shank including a plurality of compressible tongues extending generally radially outwardly of said shank, said tongues having an upper surface and a lower sloped surface,

said female connector comprising a body having a surface, and axial bore in said body for receiving said shank, said bore forming a lip at said surface, a recess in said bore remote from said surface for receiving said tongues and forming a shoulder and a flange in said recess, whereby said pin connector may be assembled to said receptacle connector by relatively rotating said connectors causing said lower sloped surface of said tongues to react against said lip causing said tongues to compress to fit within said bore and relative axial movement of said connectors permits said tongues to be received in said recess so that said tongues expand and said upper surface of said tongues react against said shoulder to lock the connectors together, and whereby said pin connector may be disassembled from said receptacle connector by relatively rotating said connectors causing said tongues to react against said flange to thereby compress said tongues to fit within said bore.

4,508,419

HYPODERMIC NEEDLE CONNECTOR

Anibal Galindo, 6500 Caballero Blvd., Coral Gables, Fla. 33146

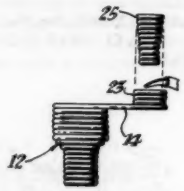
Filed Sep. 30, 1982, Ser. No. 429,168
Int. Cl.³ H01R 4/48
U.S. Cl. 339—256 S **6 Claims**

1. A hypodermic needle connector comprising:

a wire connector including a needle holder, a link and connector, and

said needle holder including a needle portion for releasably holding a hypodermic needle, said link connected to said needle portion,

said connector including a mating portion connected to said link and another mating portion connected to said mating portion of said wire connector portion for releasably connecting and securing a nerve electro finder lead wire



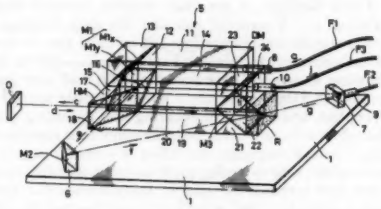
to said hypodermic needle connector for transmitting current to the hypodermic needle.

4,508,420

OPTICAL SYSTEM

Yoshikazu Nishiwaki, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 27, 1982, Ser. No. 453,546
Claims priority, application Japan, Dec. 28, 1981, 56-212574; Jan. 27, 1982, 57-11185
Int. Cl.³ G03H 1/04
U.S. Cl. 350—3.6 **16 Claims**



1. An optical system, comprising

a plurality of multi-surfaced transparent unit blocks, at least one of said unit blocks having light reflective material deposited on a surface thereof and at least another of said unit blocks being composed of a photosensitive material;

bonding means for securing together at least two of said unit blocks in a predetermined fashion; and

mounting means for mounting said unit blocks.

4,508,421

HOLOGRAPHIC SCANNING SYSTEM UTILIZING A SCAN LINEARIZATION LENS

Robert P. Herloski, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 27, 1983, Ser. No. 517,610
Int. Cl.³ G02B 27/17
U.S. Cl. 350—3.71 **1 Claim**

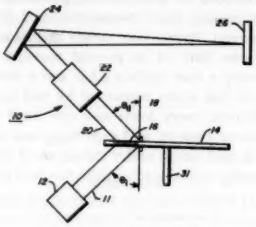
1. An optical scanning system including a spinner having formed thereon at least one plane linear diffraction grating having a constant grating period d,

a reconstruction light source of wavelength λ, which provides a beam of light directed at an angle of incidence θ_i to illuminate said grating,

means for rotating said spinner so that said grating rotates through a rotation angle ψ and diffracts a portion of the incident light at a cross-scan diffraction angle θ_d, and a scan angle θ_s and an optical lens positioned so as to intercept and focus said diffracted beam onto an image plane from the optical axis to produce a scan line thereon,

said optical lens having a third order coefficient of distortion

σ_5 and a fifth order coefficient of distortion β_9 defined by the following equations:



$$\delta_5 = -f\left[\frac{3A^2-1}{6A^2}\right]\theta_{s\,max}^3 \text{ and}$$

$$\beta_9 = -f\left[\frac{15A^4+10A^2-9}{120A^4}\right]\theta_{s\,max}^5 \text{ where}$$

f is the paraxial focal length of the lens and

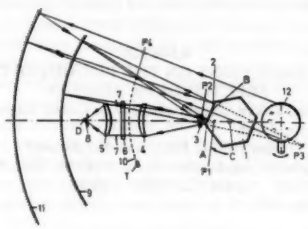
$$A = \frac{n(\text{diffraction order number})\lambda}{d}$$

4,508,422

OPTICAL SCANNING SYSTEM

Lars Karlsson, Täby, Sweden, assignor to Pharos AB, Lidingo, Sweden

Filed Mar. 3, 1983, Ser. No. 471,843
Claims priority, application Sweden, Mar. 3, 1982, 8201306
Int. Cl.³ G02B *27/17*; H04N *3/08*
U.S. Cl. 350—6.8 **18 Claims**



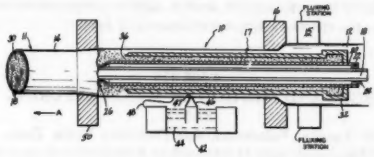
1. A scanning system for optical scanning of a scene in at least one dimension, including a multi-faceted reflective scanning rotor, optical beam converging means disposed in the beam path between the scene and the rotor for forming a primary image of the scene between the beam converging means and the rotor, a first substantially spherical mirror disposed in the beam path of the system between first and second areas of reflection on the rotor, both areas being disposed in a non-collimated beam path, a radiation detecting or emitting means disposed at the end of the beam path in the system, a beam converging optical element disposed in the beam path between the first substantially spherical mirror and the second area of reflection, and means for forming a real image of the radiation detecting or emitting means in the beam path at a position between the first substantially spherical mirror and a location so close to the beam converging optical element that the element serves as a field element for said location of said real image.

4,508,423

METHOD AND APPARATUS FOR ASSEMBLING AN OPTICAL FIBER COMMUNICATION CABLE

Joseph Winter, New Haven, and Michael J. Pryor, Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 324,242, Nov. 23, 1981,. This application Sep. 1, 1982, Ser. No. 413,846
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.23 **47 Claims**



1. An apparatus for assembling an optical fiber communication cable, said apparatus comprising:

die means for forming a tubular member having a substantially downwardly facing seam from a strip of metal or metal alloy;

means for soldering said substantially downwardly facing tubular member seam to provide a sealed tubular member; and

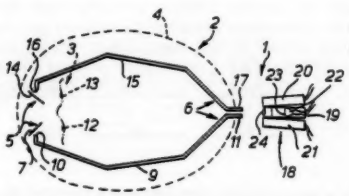
means for depositing at least one optical fiber into said sealed tubular member after said seam has been soldered, said depositing means protecting said at least one optical fiber during said soldering.

4,508,424

BINOCULAR DISPLAY OF INFORMATION WITH TWO COMBINER MEANS

Nils I. A. Ruder, The Potteries, Wickham Rd., Fareham, Hampshire, England

PCT No. PCT/GB82/00138, § 371 Date Dec. 28, 1982, § 102(e) Date Dec. 28, 1982, PCT Pub. No. WO82/03923, PCT Pub. Date Nov. 11, 1982
PCT Filed May 7, 1982, Ser. No. 457,072
Claims priority, application United Kingdom, May 8, 1981, 8114177
Int. Cl.³ G02B *27/10*
U.S. Cl. 350—174 **8 Claims**



1. Apparatus for use by an observer together with a physically separate collimated information source display to transmit a binocular display at infinity of the information source display to each eye of the observer from a location generally behind the observer, comprising a support to be worn on the observer's head, two combiner means positioned on said support, one of each of the said combiner means being within the field of view of each of the said observer's eyes, input means mounted on the said support means and generally diametrically

opposite said combiner means so as to be located in the area of the back of the observer's head in use of the apparatus and with the collimated information source display within the field of view of the input means, and two endoscope means arranged to receive and transmit the same image of said collimated information source from said input means to each of said combiner means, the optical center axes of each of said combiner means being parallel to the optical center axis of the said input means, the apparatus being constructed and arranged such that in use, with the collimated information source display being located behind and physically separate from said observer, an identical image of said collimated information source display is transmitted via said input means and said endoscope means to each of said combiner means thereby providing the same but separate images of the information source display projected at infinity within the field of eachof the observer's eyes.

4,508,425

MIRRORS AND METHOD OF MANUFACTURING THE SAME

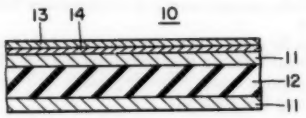
Hiroshi Tanaka, Yokohama, and Yoshitaka Iwata, Zama, both of Japan, assignors to Mitsubishi Keikinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 201,627, Oct. 28, 1980, abandoned. This application Nov. 18, 1982, Ser. No. 442,717

Claims priority, application Japan, Oct. 30, 1979, 54-140238; Jan. 16, 1980, 55-3411; Jan. 16, 1980, 55-3410

Int. Cl.³ G02B *5/08*

U.S. Cl. 350—641 **10 Claims**



1. A mirror, comprising:

a sheet of synthetic resin, an aluminum sheet bonded to each surface of said synthetic resin sheet, and an electroplated nickel layer and an electroplated chromium layer which are sequentially formed on one of said aluminum sheets.

4,508,426

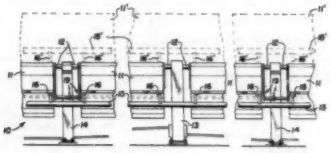
LOCKING MEANS FOR SOLAR COLLECTOR

Joseph A. Hutchison, 3300 Century Cir., Irving, Tex. 75060

Filed May 12, 1983, Ser. No. 494,047

Int. Cl.³ G02B *7/18*

U.S. Cl. 350—614 **12 Claims**



1. In a maneuverable solar collector array wherein a plurality of concave trough-like reflectors are rotatably supported between support pylon structures by rotation axle means, a latching system for holding said reflectors in a protected position, said latching system having at least one latching device comprising:

mounting plate means affixed to each reflector of an adjacent pair of reflectors and extending generally toward the lines of focus of said reflectors,

locking bar means mounted between said mounting plate means positioned intermediate said lines of focus and said rotation axles, said mounting plate means and said locking bar means rotating with said reflectors,

latching means mounted on said support pylon positioned to engage and hold said locking bar means when said reflectors are rotated to a protected position, said latching means comprising lever means mounted for limited pivotal movement, spring bias means maintaining said lever means at one limit of its pivotal movement, said lever means having a cam surface edge and a notch edge positioned such that when contacted by said locking bar said lever is moved away from said one limit allowing said locking bar to pass by said cam edge and to be received and held in said notch under influence of said spring bias means thereby locking each reflector in a protected position.

4,508,427

LIQUID CRYSTAL DISPLAY DEVICE

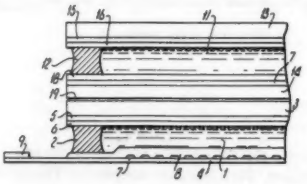
Peter W. Ross, Stansted, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,466

Claims priority, application United Kingdom, Oct. 22, 1982, 8230259

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—335 **5 Claims**



5. A liquid crystal display device having a tandem arrangement including a rear cell and a front cell, the rear cell being a silicon matrix backed dyed nematic cell with 180° twist cell for overriding grey scale representations, the front cell being a dyed nematic cell oriented to act as a variable density polariser for absorbing the weakly absorbed plane of the rear cell.

4,508,428

INK PROJECTIONS ON THE POLARIZER OF AN ELECTRO-OPTIC DISPLAY

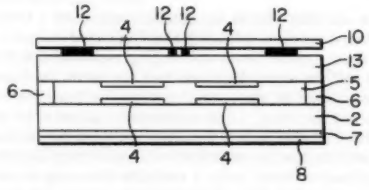
Yuji Harada, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,667

Claims priority, application Japan, Feb. 16, 1981, 56-21124

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—337 **6 Claims**



1. An electro-optic device comprising:

(a) a liquid crystal cell including first and second substrates, each having an electrode, defining a gap therebetween, the periphery of said gap being sealed with a sealing member, and said gap is filled with a liquid crystal material;

(b) a first polarizing means placed at the front side of said first substrate; and

(c) a second polarizing means placed at the back side of said second substrate, characterized in that a printing ink layer is formed between said first substrate and said first polarizing means at least within an effective display region of said liquid crystal cell.

4,508,429

METHOD FOR DRIVING LIQUID CRYSTAL ELEMENT EMPLOYING FERROELECTRIC LIQUID CRYSTAL

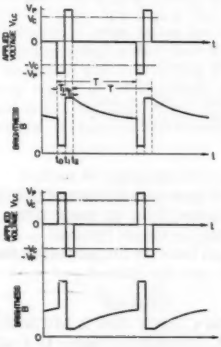
Yoshiharu Nagae; Masato Isogai, both of Hitachi; Hideaki Kawakami, Mito, and Fumio Nakano, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1983, Ser. No. 484,462

Claims priority, application Japan, Apr. 16, 1982, 57-62325

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—350 S **9 Claims**



1. A method for driving a liquid crystal element including a ferroelectric liquid crystal interposed between a pair of substrates which have electrodes on their confronting surfaces, said method comprising:

a first step of applying to said ferroelectric liquid crystal a pulse voltage which defines the light transmitting state of said liquid crystal element; and

a second step of applying to said ferroelectric liquid crystal before and/or after said first step a voltage signal which renders the average value of voltages applied to said ferroelectric liquid crystal equal to zero.

4,508,430

ELECTROCHROMIC DISPLAY CELL I

Helmut Freller, Röthenbach; Friedrich Hörauf, Nuremberg; Hans-Peter Lorenz, Schwarzenbruck, and Konrad Mund, Uttenreuth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

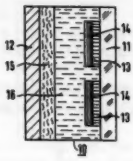
Filed Sep. 21, 1982, Ser. No. 420,926

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138705

Int. Cl.³ G02F *1/23*

U.S. Cl. 350—351 **19 Claims**

1. An electrochromic display cell comprising a front electrode having a tungsten trioxide layer and an outer support surface, a rear electrode having a porous titanium nitride layer



and an outer support surface, and an electrolyte contacting the tungsten trioxide and porous titanium nitride layers.

4,508,431

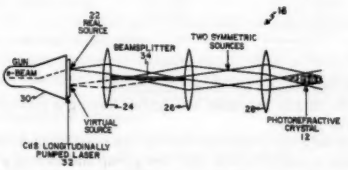
PHOTOREFRACTIVE LASER BEAMSTEERING DEVICE

Philip D. Henshaw, Carlisle, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 11, 1982, Ser. No. 338,466

Int. Cl.³ G02F *1/29*

U.S. Cl. 350—354 **16 Claims**



1. Apparatus for steering a principal beam of electromagnetic radiation comprising:

A. a photorefractive material situated such that said principal beam passes therethrough, said photorefractive material being photoconductive and having an index of refraction that is variable in response to transverse electro-optical effects, and

B. variable writing means for irradiating said photorefractive material with at least two beams which intersect one another and which are each transverse to the principal beam so as to write a diffraction grating in said photorefractive material and thereby vary the index of refraction of said photorefractive material, wherein the angle at which said two beams intersect is variable such that for a desired angle of deflection said diffraction grating is formed at about an angle set by Bragg's law so as to optimize steering efficiency.

4,508,432

ELECTROCHROMIC DISPLAY CELL II

Helmut Freller, Röthenbach, and Konrad Mund, Uttenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,928

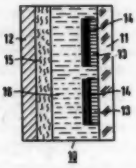
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138760

Int. Cl.³ G02F *1/23*

U.S. Cl. 350—357 **14 Claims**

1. An electrochromic display cell comprising a front elec-

trode having an electrochromic layer and an outer support surface, a rear electrode having an activated vitreous carbon



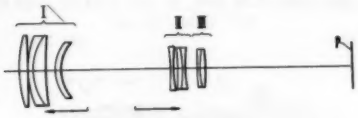
layer and an outer support surface, and an electrolyte contacting the electrochromic and activated vitreous carbon layers.

4,508,433

TELEPHOTO OBJECTIVE

Nozomu Kitagishi, and Sadahiko Tsuji, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 139,764, Apr. 14, 1980, abandoned. This application May 2, 1983, Ser. No. 489,393
Claims priority, application Japan, Apr. 20, 1979, 54-48658
Int. Cl.³ G02B *13/02, 9/62, 9/64*
U.S. Cl. 350—454 **13 Claims**



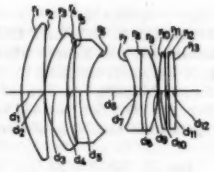
1. A telephoto objective comprising:
a first axially movable lens group having a positive refractive power;
a second axially movable lens group positioned on the image side of said movable first lens group and having a negative refractive power; and
a fixed lens group positioned on the image side of said movable second lens group and having a positive refractive power;
said first and said second movable lens groups being arranged to be moved simultaneously in opposite axial directions to focus the telephoto objective on an object and when focused at an infinite distance the distance between the first axially movable lens group and the second axially movable lens group being smaller than the distance between the second axially movable lens group and the fixed lens group.

4,508,434

BRIGHT MEDIUM-RANGE TELEPHOTO LENS

Ryota Ogawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,570
Int. Cl.³ G02B *9/62, 13/02*
U.S. Cl. 350—454 **5 Claims**



1. A bright medium-range telephoto lens comprising, in order from an object, a first positive lens having a stronger positive power toward the object, a second positive-meniscus lens having a stronger positive power toward the object, a third negative-meniscus lens having a stronger negative power toward an image, a compound lens spaced from the third lens with an aperture interposed therebetween and having a fourth negative lens having a stronger negative power toward the object and a fifth positive lens having a stronger positive power toward the image, a sixth positive lens, and a seventh positive lens having a weak power, the bright medium-range telephoto lens meeting the following conditions:

$$1.65 < (n_1 + n_2)/2 < 1.8 \quad (1)$$
$$50 < (\nu_1 + \nu_2)/2 \quad (2)$$
$$0.8 < f/f_{1,2} < 1.2 \quad (3)$$
$$1.65 < f/f_{1,4} < 1.95 \quad (4)$$
$$0.4f < r_3 < 0.55f \quad (5)$$
$$-0.65 < \left(\frac{n_3 - 1}{r_5} - \frac{n_2 - 1}{r_4}\right) f < -0.35 \quad (6)$$
$$0.35 < f/f_{1,6} < 0.55 \quad (7)$$
$$1.65 < n_3 < 1.8 \quad (8)$$
$$\nu_3 < 35 \quad (9)$$
$$0.25f < d_1 + d_2 + d_3 + d_4 + d_5 < 0.4f \quad (10)$$
$$0.2f < d_6 < 0.3f \quad (11)$$
$$0.1 < n_5 - n_4 \quad (12)$$
$$0.09f < d_7 + d_8 < 0.15f \quad (13)$$
$$0.05f < r_7 - r_9 < 0.12f \quad (14)$$
$$5 < \nu_5 - \nu_4 < 15 \quad (15)$$
$$0.45 < f/f_{1,9} < 0.65 \quad (16)$$
$$0.85 < f/f_{1,11} < 0.95 \quad (17)$$

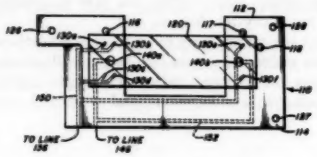
where
ri: the radius of curvature of the ith surface,
di: the thickness of inter-lens distance of the ith lens,
ni: the refractive index of the ith lens at d-line,
νi: the Abbe number of the ith lens, and
$f_{1,i}$: the focal length from the first surface to the ith surface.

4,508,435

AIR VACUUM CHUCK FOR A MICROSCOPE

Marshall D. Graham, Framingham; Dudley D. Cook, Jr., Acton; Donald L. Gecks, Bedford, and Robert Shaw, Concord, all of Mass., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jun. 18, 1982, Ser. No. 390,049
Int. Cl.³ G02B *21/24*
U.S. Cl. 350—529 **11 Claims**



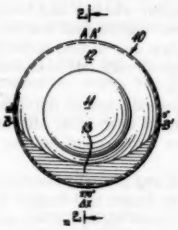
1. A chuck system for selectively aligning and supporting an object-bearing planar surface of a microscope slide comprising:
A. a body member having a substantially planar slide-supporting surface, and
B. a plurality of stop members adapted to interferingly engage a slide adjacent to said slide-supporting surface with a predetermined orientation
wherein said body member includes a plurality of alignment air ports and vacuum ports in said slide-supporting surface and associated internal passageways, at least one of said air ports being adapted to direct an airflow therefrom having an alignment component directed towards at least one of said stop members.

4,508,436

SOFT TORIC CONTACT LENS

George Sitterle, Jacksonville, Fla., assignor to Frontier Contact Lenses of Florida, Inc., Jacksonville, Fla.

Filed Sep. 28, 1981, Ser. No. 306,438
Int. Cl.[3] G02C 7/04
U.S. Cl. 351—160 H 8 Claims



1. A soft toric contact lens of spherocylindrical power having a concave inner surface, a convex outer surface, a horizontal axis and a vertical axis;

said outer surface having a central optical zone and a peripheral lenticular zone;

said lens including a prism ballast in the vertical axis, the degree of prism being greater than about 1.0 diopter;

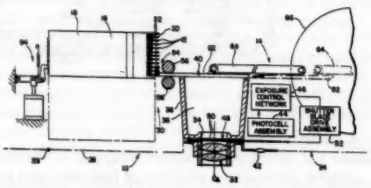
the outer surface of said lens having a smoothly beveled, tapered-off region in the lenticular zone in the area of maximum ballast, the edge of said lens having a substantially uniform thickness in said tapered-off region.

4,508,437

METHOD AND APPARATUS FOR EXPOSING AND VIEWING AT SAME STATION

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 1, 1983, Ser. No. 519,085
Int. Cl.[3] G03B 17/52
U.S. Cl. 354—78 11 Claims



1. A photographic apparatus for use in automatically exposing film units having a photosensitive area at a focal plane and for allowing processed ones of these units to be viewed at the same focal plane comprising:

means for directing image forming light rays from a scene to be photographed to the focal plane;

means for storing film units before and after exposure of the units;

means operable for causing distribution of processing fluid over the photosensitive area of the film unit prior to viewing of the film unit;

means for controlling passage of scene light to the focal plane for exposing the photosensitive area at the focal plane;

optical means for optically permitting viewing of the scene images prior to exposure and for permitting viewing of the film units at the same focal plane following exposure; and,

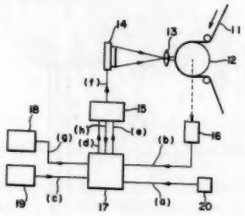
film handling means operable in response to initiation of a cycle for advancing an unexposed one of the stored units to the focal plane and for selectively exposing the unit at the focal plane, said film handling means including means being operable for presenting the film unit at the focal plane for viewing.

4,508,438

SIDE PRINTING METHOD AND APPARATUS THEREFOR

Takeshi Kanaoka, and Shigehisa Shimizu, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 13, 1983, Ser. No. 503,581
Claims priority, application Japan, Jun. 15, 1982, 57-102384
Int. Cl.[3] G03B 17/24
U.S. Cl. 354—105 12 Claims



1. A side printing apparatus for photographically exposing marks onto a moving strip of photosensitive material, said apparatus comprising:

means for continuously advancing said strip of photosensitive material lengthwise;

multi-element luminous display means with a two-dimensional matrix of light emitting elements for displaying a mark to be photographically exposed onto said moving photosensitive material;

means for generating synchronizing signals under the influence of which a mark exposing cycle starts;

means for generating position signals corresponding to the advanced length of said moving photosensitive material;

means for generating signals indicating a desired type of mark to be photographically exposed onto said moving photosensitive material;

main controlling means for generating signals representing said desired type of mark upon the reception of said synchronizing signal, said position signal and said indicating signal;

means for driving said multi-element luminous display means at predetermined time intervals by signals from said main controlling means while said strip is moving to illuminate simultaneously a plurality of said light emitting elements in a pattern unique to said mark; and

a lens system for forming a reduced image of said mark displayed on said multi-element luminous display means on said moving photosensitive material.

4,508,439

SINGLE LENS REFLEX CAMERA

Tsunemasa Ohara, Tokyo; Masayuki Suzuki, and Masayoshi Yamamichi, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,406
Claims priority, application Japan, Oct. 6, 1981, 56-159183
Int. Cl.[3] G03B 19/12
U.S. Cl. 354—154 6 Claims

1. A single lens reflex camera comprising:

(A) a picture taking lens system defining a picture taking optical path;

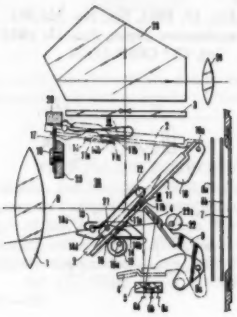
(B) a first mirror having a portion for allowing passage of a light therethrough;

(C) supporting means for supporting the first mirror, said

supporting means having a portion for allowing passage of the light coming through the light passage allowing portion of the first mirror and being movable to position the first mirror in said picture taking optical path and to retract the first mirror out of said picture taking optical path;

(D) photoelectric means sensitive to light;

(E) a second mirror for reflecting the light coming through the light passage allowing portion of said supporting means;



(F) first light shielding means movable relative to said light passage allowing portion of said supporting means, said first light shielding means closing below said light passage allowing portion of said supporting means when the first mirror is retracted out of the picture taking optical path by the supporting means; and

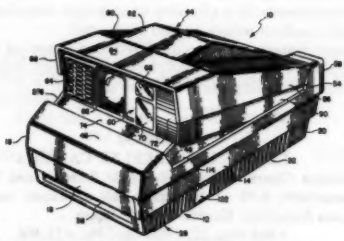
(G) a second light shielding means for preventing the reflected light from an edge of said allowing portion of said supporting means from entering said photoelectric means, and wherein said second shielding means includes a mask made of opaque thin film.

4,508,440

BELLOWS SHIELDING STRUCTURE

Peter F. Costa, Winthrop, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 22, 1983, Ser. No. 534,824
Int. Cl.³ G03B *17/04*
U.S. Cl. 354—187 **4 Claims**



1. A folding camera comprising:

a first housing having a leading end wall, a trailing end wall, and a pair of laterally spaced side walls interconnecting the lateral ends of said leading end and trailing end walls so as to define a chamber therebetween;

a second housing having a leading end, a trailing end, and first and second laterally spaced side walls;

a module including a lens and shutter assembly fixedly supported at said leading end of said second housing;

a flexible bellows interconnecting said first and second housings;

means for pivotally coupling said trailing end of said second housing to said first housing at a point adjacent said trailing end wall for pivotal movement between a folded inoperative position wherein substantial portions of said first and second side walls of said second housing and said module are located within said chamber, and an erected operative position wherein said module is spaced from said leading end wall of said first housing, and said side walls of said first and second housings define triangular shaped openings on each side of said camera adjacent sides of said bellows;

first and second laterally spaced skirts fixedly secured to said second housing so as to close off said triangular shaped openings when said second housing is in said erected position; and

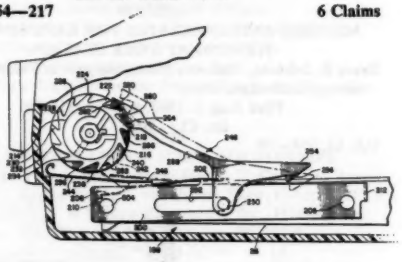
a plate having one end pivotally coupled to said first housing and an opposite second end located in enagement with a lower surface of said module when said second housing is in said erected position, said plate having a width substantially equal to the lateral distance between said first skirt and one of said side walls of said first housing to thereby close off the space between said leading end wall and said module, whereby said bellows is shielded from the ambient light and from contact by the user of said camera.

4,508,441

FILM COUNTER

Kenneth J. Launie, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 22, 1983, Ser. No. 534,825
Int. Cl.³ G03B *17/36*
U.S. Cl. 354—217 **6 Claims**



1. A camera comprising:

means for defining a chamber adapted to receive a film cassette containing a plurality of film units and an opaque dark slide;

means for removing the dark slide and the film units sequentially from the film cassette in response to specific acts by a user of said camera;

a film counter for presenting sequentially changeable characters to a viewing window in a wall of said camera, the characters representing a starting position, an end position, and the number of film units remaining within the film cassette between the starting and end positions, said film counter including a plurality of indexable members, said indexable members including first and second indexable members which are spaced from each other by a distance greater than that between the remaining indexable members;

means for sequentially engaging said indexable members so as to index said film counter in a first direction against the bias of a return spring; and

means for limiting movement of said film counter in a second direction, generally opposite to said first direction, said limiting means includes a first surface adapted to be sequentially engaged by all of said indexable members dur-

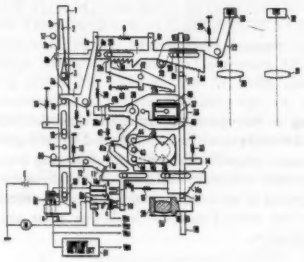
ing movement of said film counter in said second direction to thereby maintain said film counter in each newly indexed position, and a second surface which is adapted to be engaged only by said first indexable member.

4,508,442

ELECTROMAGNETICALLY DRIVEN SHUTTER CAMERA HAVING AUTOMATIC FOCUSING DEVICE

Michio Hirohata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1982, Ser. No. 413,464
Claims priority, application Japan, Sep. 8, 1981, 56-141534; Sep. 9, 1981, 56-142816
Int. Cl.³ G03B *3/10, 9/14*
U.S. Cl. 354—400 **12 Claims**



1. Camera including:

(a) a coil arranged in a magnetic field, said coil responsive to a current supply moving from an initial position and responsive to a termination of the current supply returning to the initial position;

(b) latching means arranged to make a round trip when said coil moves and returns;

(c) control means for controlling a focus adjusting operation, said control means upon movement in a predetermined direction performing the focus adjusting operation and upon engagement with said latching means being hindered from movement, and said control means having a plurality of teeth each engageable with said latching means;

(d) signal generating means for producing a pulse-shaped electrical signal so as to repeat cyclic current supplies to said coil, said signal generating means controlling the current supply to said coil in such a manner that one pulse of the electrical signal allows for said latching means to engage the next tooth of said control means;

(e) blade members for performing an exposure operation; and

(f) transmitting means for transmitting the round trip of said coil to said blade members to open and to close said blade members, said transmitting means being displaceable independently of said coil when said coil moves forwards, and displacing as a unit with said coil when said coil returns.

4,508,443

LENS BARREL

Minoru Matsuzaki; Akihiko Hachimoto; Takashi Inoue, all of Hachioji; Hitoshi Shirai, Sagamihara; Akira Watanabe, Fuchu, and Ikuo Tofukuji, Okaya, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1983, Ser. No. 524,671
Claims priority, application Japan, Oct. 5, 1982, 56/175181
Int. Cl.³ G03B *3/00*
U.S. Cl. 354—402 **15 Claims**

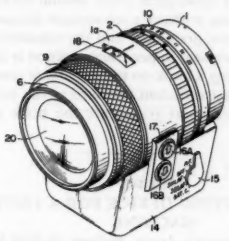
8. A lens barrel comprising

a motor for moving a taking lens;

distance measuring means for measuring a distance to an object being photographed;

automatic focus adjusting means operable in an "auto-focus" mode to cause the motor to move the taking lens into an in-focus position in response to an output from the distance measuring means;

mode changing means for selecting a sequence "auto-focus" mode which enables the automatic focus adjusting means to operate continuously to adjust the focus and a single



"auto-focus" mode in which a single focus adjustment is made;

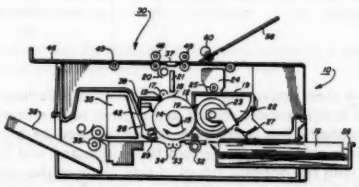
and an operating member used in common in both modes, the operating member being operable to initiate a movement of the taking lens into the in-focus position under the drive from the motor during both the sequence and the single "auto-focus" mode.

4,508,444

MULTIMODE DOCUMENT HANDLING APPARATUS AND REPRODUCING APPARATUS CONTAINING SAME

Joseph N. May, Fairport, and Joseph M. Wing, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1982, Ser. No. 403,602
Int. Cl.³ B65H *5/06, 9/06, 3/44, 5/02*
U.S. Cl. 355—3 R **23 Claims**



1. A multimode document handling apparatus comprising an upper frame portion pivotally mounted along its rear edge to a lower base frame portion to thereby provide open and closed positions of said upper frame portion relative to said lower base frame portion,

said lower base frame portion comprising a substantially horizontal imaging platen over which a document to be reproduced may be transported, document transport means to transport a document in a forward direction over said imaging platen, means to reverse the direction of document transport, means to transport a document in a reverse direction back across said imaging platen preparatory to again being transported in a forward direction across said imaging platen to make an additional copy of said document,

said upper frame portion comprising a document loading chute which when said upper frame portion is in the closed position is inclined to the horizontal, the lower exit portion of said chute being in operative communication with said means to transport a document over said imaging platen and positioned upstream of said imaging platen, said document loading chute including gate means to permit loading a subsequent document in the chute pre-

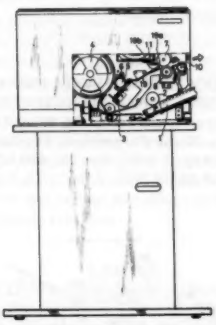
paratory to copying while preventing it from being fed while the preceeding document is being copied whereby said apparatus provides multimode reproducing capabilities including the making of multiple copies of a document by transporting the document forward across the imaging platen, reversing the direction and transporting the document back across the imaging platen preparatory to being transported in a forward direction across the imaging platen to make a subsequent copy; stream feeding of successive documents without a subsequent document overlapping a previous document and the capability to copy from a book when said upper frame portion is in the open position by placing a book on the document transport and manually applying sufficient pressure to the book so that the document transport transports the book across the imaging platen.

4,508,445

SHEET CONVEYING DEVICE FOR A COPYING MACHINE

Hirotaka Izumi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1983, Ser. No. 528,013
Claims priority, application Japan, Aug. 31, 1982, 57-151183
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 SH **2 Claims**



1. A sheet conveying device for a copying machine having a toner image transfer section and a fixing section comprising a substantially flat sheet guide chute adapted to be disposed between said toner image transfer section and said fixing section with the opposite edges of said chute at the end thereof adapted to be disposed adjacent said fixing section being turned downwardly to prevent the middle portion of the sheet being conveyed through the fixing section from floating off the surface of said chute.

4,508,446

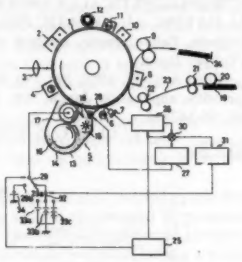
REPRODUCTION PROCESS CONTROL METHOD

Chikara Imai, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Feb. 9, 1983, Ser. No. 465,327
Claims priority, application Japan, Feb. 9, 1982, 57-19220; Jun. 18, 1982, 57-104873; Jun. 18, 1982, 57-104874
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **5 Claims**

1. A method for controlling a copying process, which uses a photosensitive member and includes at least the steps of uniformly charging said photosensitive member, exposing an image to the thus charged photosensitive member to form an electrostatic latent image thereon and developing the latent image, by changing process variables regarding said copying process depending upon the temperature of said photosensitive member, said process variables to be changed including at least the amount of uniform charging, the amount of exposure and the level of developing bias voltage and a reference temperature being predetermined for said photosensitive member, said method comprising the steps of:

detecting the temperature of said photosensitive member to determine whether the detected temperature is higher or lower than said predetermined reference temperature; and



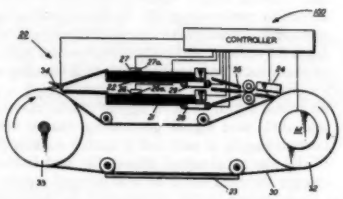
changing a first group of process variables when the detected temperature has been found to be higher than said reference temperature; whereas, changing a second group of process variables different in combination from said first group of process variables when the detected temperature has been found to be lower than said reference temperature.

4,508,447

ALTERNATIVE FEEDING DOCUMENT RECIRCULATION

Michael S. Doery, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 21, 1983, Ser. No. 487,404
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **17 Claims**



1. In an automatic document handling system for recirculating a set of document sheets seriatim in a page order to and from the imaging station of a copier for making precollated copy sheet sets, said document handling system having control means and two document trays, the improvement for higher speed document recirculation for copying on a copier having a high copying rate at said high copying rate comprising:

automatic document sheet separating means controlled by said control means for automatically, during the first circulation of the set of document sheets, separating the set of document sheets into two half-sets of alternate page document sheets and restacking said half-sets respectively in said two document trays;

automatic alternate document sheet cooperative feeding means actuated automatically by said control means on the second and subsequent copying circulations of the document set to feed document sheets alternately from said two document sheet half-sets in said two document trays so as to feed document sheets at said high copying rate and in page seriatim order directly to be copied on said copier;

and wherein said automatic document sheet separating means in said second and subsequent, but not the last, copying circulations is controlled by said control means to reseparate said document sheets after they are copied and return them to said two document trays.

4,508,448

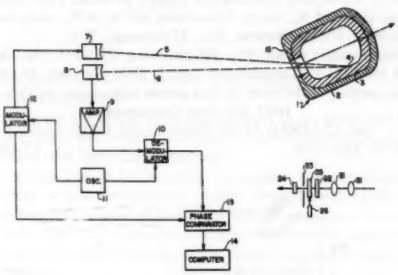
APPARATUS FOR MEASURING THE DISTANCE TO A POINT ON THE INNER WALL OF A HOT FURNACE

Ragnar Scholdstrom; Holger Marcus, and Lennart Nordstrom, all of Lidingo, Sweden, assignors to Geotronics AB, Sweden

Continuation of Ser. No. 142,430, Apr. 21, 1980, abandoned, which is a continuation of Ser. No. 788,346, Apr. 18, 1977, Pat. No. 4,227,802, which is a continuation-in-part of Ser. No. 635,081, Nov. 25, 1975, abandoned. This application Sep. 30, 1982, Ser. No. 430,592

Int. Cl.³ G01C *3/08;* **G02B** *5/28, 5/22*

U.S. Cl. 356—5 **15 Claims**



1. A method for measuring the distance to a point on a light frequency, self-radiating inner wall of a lined vessel having a temperature of at least about 500° C., the method comprising the steps of:

providing an electro-optical distance measuring instrument having the capability of transmitting a modulated radiation signal within a narrow frequency band, receiving a reflected transmitted signal, and determining by phase comparison methods the distance from the electro-optical measuring instrument to the point of reflection;

providing an optical filter aligned in the receiving path of said electro-optical distance measuring instrument to filter out all radiation other than said narrow frequency band of transmitted radiation, said optical filter comprising the combination of an interference filter and a Fabry-Perot filter in which the central passband of the Fabry-Perot filter lies within the passband of the interference filter and the side bands of the Fabry-Perot filtering lie outside the passband of the interference filter;

focusing said modulated radiation signal of said electro-optical distance measuring instrument on a point of the inner wall of said light frequency, self-radiating lined vessel;

receiving the reflected transmitted signal from said point through said optical filter; and

determining by phase comparison methods the distance from the electro-optical distance measuring instrument to said point on said light frequency, self-radiating inner wall of said lined vessel.

4,508,449

APPARATUS FOR MEASURING DIAMOND COLORS

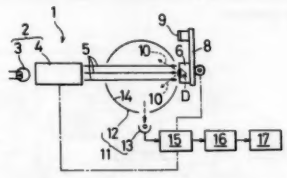
Nobuo Okazaki, Nagaokakyo, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Jun. 18, 1982, Ser. No. 389,977

Claims priority, application Japan, Jun. 25, 1981, 56-99228

Int. Cl.³ G01J *3/50*

U.S. Cl. 356—30 **3 Claims**



1. An apparatus for measuring the color of a brilliant cut diamond comprising:

a light source for providing a measuring light;

a rotatable diamond holder comprising a rotatable base, a holder mounted on said base and including a conical recess defined in said holder for receiving the pavillion of a diamond to be measured and a suction hole extending from said recess, a motor operable for driving said rotatable base, and a vacuum pump, said base having a cavity communicating with said holder suction hole and said vacuum pump so that the pavillion of a diamond received in said conical recess is retained on said operatively rotatable holder under suction generated by said vacuum pump;

a photodetector including a monochromator and a photosensor for detecting a beam of light from the diamond as monochromatic light;

an integrating sphere in one of said light source and said photodetector;

a measurement unit for controlling the monochromator and the photosensor to obtain a spectrum of said detected light; and

an arithmetic unit for deriving tristimulus values X, Y and Z from the measured spectrum.

4,508,450

SYSTEM FOR CHECKING DEFECTS ON A FLAT SURFACE OF AN OBJECT

Ken Ohshima, and Masaharu Sakamoto, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,621

Claims priority, application Japan, Mar. 31, 1981, 56-48004

Int. Cl.³ G01N *21/88*

U.S. Cl. 356—237 **5 Claims**

1. A checking system for checking defects on a flat surface of an object to be checked, comprising:

means for generating laser beams;

means for projecting the laser beams onto the surface of the object and for directing the laser beam reflected from the surface of said object in a given direction;

means for scanning the surface of the object with the laser beam;

means for detecting the laser beam reflected from the projecting means and converting it to an electric signal;

means for comparing the level of an electric signal from the detecting means with a reference level to produce a defect signal corresponding to a defect on the surface of the object;

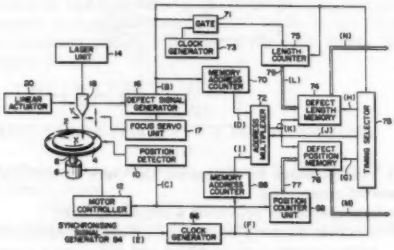
generating means for sequentially generating a position signal associated with a position on the object scanned with the laser beam;

first means for storing the position signal, received from said

generating means, as defect start position data in response to the defect signal;

second means for storing data corresponding to the length of the detected defect which in turn corresponds to the length of the defect signal as defect length data;

means for providing said detect start position data on a predetermined portion of the surface area of the object which is less than the whole surface area of the object, and said defect length data associated with said defect start position data corresponding to said predetermined surface area portion;



picture element converting means for converting said defect start position data and said defect length data, provided by said providing means, to picture element data;

third means for storing said picture element data;

read out means for reading said picture element data out of said third means; and

means for displaying a defect image of said predetermined surface area portion of the object by using the picture element data read out by said read out means.

4,508,451

ATOMIC ABSORPTION SPECTROPHOTOMETER

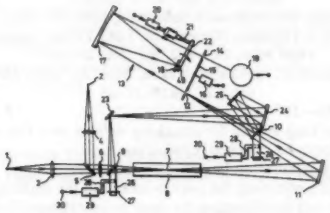
Trevor J. Stockdale, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1982, Ser. No. 450,489

Claims priority, application United Kingdom, Jan. 19, 1982, 8201371

Int. Cl.³ G01J *3/42*; G01N *21/72*

U.S. Cl. 356—315 **13 Claims**



1. An atomic absorption spectrophotometer comprising

a flame atomizer,

means for alternatively providing sample and reference paths,

said sample path including said flame atomizer, and said reference path excluding said flame atomizer,

detector means for detecting resonance line radiation characteristics of atomic elements,

circuitry means for providing command signals representative of control of the spectrophotometer,

signal processing means for processing signals from said detector means and for processing said command signals,

wherein when one of said command signals indicates a required measurement of a blank sample, said signal processing means responds to an output signal from said detector means, said output signal being representative of said sample path for a given measurement time to set a baseline,

wherein said detector means provides repeated and compared measurements from said reference path to update said baseline in said signal processing means, and

wherein when one of said command signals indicates a required measurement of a sample to be analyzed, said signal processing means responds to a detector output representative of said sample path for a given sample measurement time to quantitatively determine at least one atomic element of said sample to be analyzed with respect to the updated baseline, and

control means for determining periods for which said sample and reference paths are provided, said control means being responsive to said command signals,

such that said sample path is provided uninterrupted for the entire period of each sample measurement time.

4,508,452

ARRANGEMENT FOR SENSING THE CHARACTERISTICS OF A SURFACE AND DETERMINING THE POSITION OF POINTS THEREON

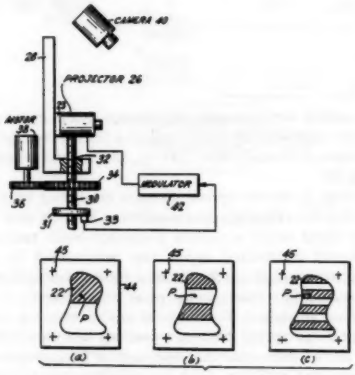
Paul L. DiMatteo, Huntington; Joseph A. Ross, Fort Salonga, and Howard K. Stern, Greenlawn, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Continuation of Ser. No. 608,266, Aug. 27, 1975, Pat. No. 4,185,918. This application Jun. 1, 1979, Ser. No. 44,642

The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.

Int. Cl.³ G01B *11/24*; G01C *11/02*; G01B *11/00*

U.S. Cl. 356—375 **12 Claims**



1. A method for sensing and locating points on a surface comprising the steps of: generating a projection field directed onto a surface; applying relative motion between said projection field and said surface in at least one direction parallel to a coordinate axis applied to the surface; subdividing said projection field into a number of selected sections during said relative motion and irradiating said surface with different variations of said subdivided projection field so that each section is illuminated at least once; recording within a field of view images of said surface as irradiated by the subdivided projection field; recording a calibrated reference surface and correlating said recorded images in relation to said reference surface to define the location of a predetermined point on said surface first-mentioned and appearing within said field of view.

4,508,453
PATTERN DETECTION SYSTEM

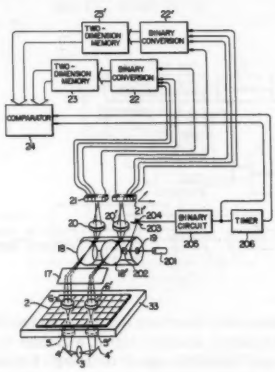
Yasuhiko Hara; Nobuyuki Akiyama; Satoru Fushimi; Yoshimasa Oshima, and Nobuhiko Aoki, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 13, 1982, Ser. No. 397,900

Claims priority, application Japan, Jul. 14, 1981, 56-108885; Oct. 19, 1981, 56-165744; Nov. 6, 1981, 56-177161

Int. Cl.³ H06N *7/18*

U.S. Cl. 356—394 **11 Claims**



1. A pattern detection system comprising:

illumination means;

first means for linearly moving objects to be measured in a first direction so that said objects are illuminated by lights from said illumination means;

an optical system for imaging the objects to be measured;

second means including a rotary multi-faced mirror for repeatedly scanning the objects to be measured in a second direction intersected at a predetermined angle with respect to the direction of the objects moved by said first means;

a plurality of photosensor means each including a photosensor array arranged in a direction perpendicular to the direction of images scanned by said second means, on the surface of which said images are formed through said optical system, and for generating respective outputs in a multiplexed manner;

wherein said first means includes means for constantly advancing the objects in said first direction at a speed such that the objects will move through a distance corresponding to the optical length of a photosensor array during one scanning period of the rotary mirror while the rotary mirror is scanning so that resulting skew scan of the objects is effected to thereby detect optical images of the objects in said photosensor arrays.

4,508,454
EXTRUDER

Dietmar Anders, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed May 25, 1983, Ser. No. 498,170

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1982, 3221472

Int. Cl.³ B29B *1/06*

U.S. Cl. 366—80 **5 Claims**

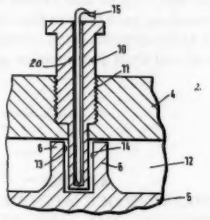
1. An extruder for processing material, comprising:

(a) an extruder cylinder,

(b) an extruding screw mounted for rotation in said cylinder, said screw being formed with a helical land on the periphery thereof, said land being formed with circumferential grooves at predetermined locations longitudinally of the land,

(c) drive means for rotating said screw,

(d) a plurality of pins extending radially through said cylinder toward the axis of said screw, said pins being located on said cylinder so as to be received with clearance in said grooves formed in the helical land of said screw,



(e) each of said pins being formed with an axial blind bore closed at the radially inner end of the pin,

(f) means disposed in each of said blind bores for signalling breakage of said pin, and

(g) means connected to said signalling means for disconnecting said drive means for said screw thereby preventing damage due to the breakage of said pin.

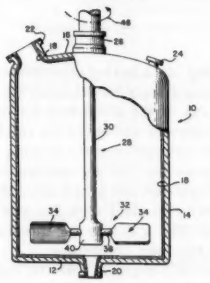
4,508,455
AGITATOR INCLUDING IMPELLER ASSEMBLY AND SHAFT HAVING INTERFERENCE FIT

Michael J. Lerman, Edison, N.J.; Richard Koehl, Niederbronn les Bains, France; Anthony A. Chiarella, Middletown, and William Zamory, Somerville, both of N.J., assignors to De Dietrich (USA), Inc., Union, N.J.

Filed Nov. 21, 1983, Ser. No. 552,992

Int. Cl.³ B01F *7/22*

U.S. Cl. 366—247 **22 Claims**



1. An agitator for use in stirring, agitating, mixing, and so forth materials such as reactants and reaction products within a vessel comprising:

(a) a shaft adapted to be supported by said vessel at a proximal end for supporting an impeller assembly within a region extending from the distal end;

(b) an impeller assembly including

(1) at least one axial tier of blade members,

(2) at least one blade member in each tier having a a blade portion and an arm extending from said blade portion provided with a surface having a constant taper away from said blade portion, and

(3) a coating of corrosion resistant material covering the entire surface of each said blade member;

(c) support means for supporting each blade member in each axial tier of blade members, said support means including

a bore in said shaft within said region extending toward the longitudinal axis of said shaft, with each bore having a constant tapered surface complementary to the tapered surface of said arm whereby said tapered surfaces may be received together telescopically and moved relative to one another under an assembling force; and

(d) a coating of a corrosive resistant material covering the surface of said shaft as shall extend within said vessel and the surface along each bore so that said relative movement results in an interference fitted connection between coated surfaces of said shaft and impeller assembly.

4,508,456

STRIKING CLOCK WITH DEVICE FOR DISCONNECTING THE STRIKING MECHANISM

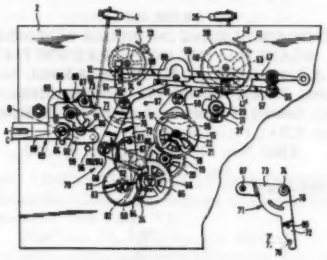
Rolf Hepfer, Bad Dürrheim, and Jürgen Rünzler, Spaichingen, both of Fed. Rep. of Germany, assignors to Joseph Kieninger Uhrenfabrik GmbH, Fed. Rep. of Germany

Filed Jan. 13, 1984, Ser. No. 570,495

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323420

Int. Cl.[3] **G04B** *23/00*

U.S. Cl. 368—262 **10 Claims**



1. In a striking clock having at least one striking mechanism, at least one release lever for releasing the striking mechanism to cause striking of the clock and for retaining the striking mechanism to prevent striking of the clock, a barrel cam associated with the release lever for moving the release lever to release and retain the striking mechanism, a clockwork for rotating the barrel cam and a lock disk (23) driven one revolution in 24 hours by the clockwork, the lock disk having a sector type lock cam (24), a device for disconnecting the striking mechanism at any time, comprising:

a feeler lever (67) engaged with the lock disk and movable between a first released position and a second stop position when said feeler lever contacts the sector type lock cam;

a lock lever (62) couplable with said feeler lever and engagable with the release lever for moving the release lever to retain the striking mechanism when said feeler lever is in its stop position;

a coupling lever (71) associated with said lock and feeler levers and moveable from a coupling position to couple said feeler lever to said lock lever and an uncoupling position for uncoupling said feeler lever from said lock lever; and

a manually movable switch lever (83) engageable with said coupling lever at any time for moving said coupling lever to its uncoupling position to uncouple said feeler lever from said lock lever to permit release of the striking mechanism.

4,508,457

ELECTRONIC TIMEPIECE WITH RECORD/PLAYBACK CIRCUITS

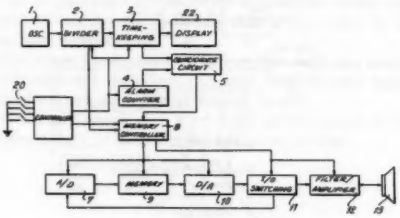
Hitomi Aizawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Japan

Filed Nov. 24, 1982, Ser. No. 444,294

Claims priority, application Japan, Nov. 27, 1981, 56-191221; Sep. 8, 1982, 57-156099

Int. Cl.[3] **G04B** *21/08;* **G11C** *13/00*

U.S. Cl. 368—63 **38 Claims**



1. In an electronic timepiece including an oscillator generating a high frequency standard signal, a divider network dividing down said standard signal to lower frequency signals, timekeeping means for accumulating said lower frequency signals as timekeeping data, a display for displaying at least a portion of said timekeeping data, the improvement therein comprising:

memory means for storing digital data therein at a plurality of addresses;

a digital/analog converter for receiving digital data from said memory addresses in sequence and outputting analog signals corresponding to said digital data;

output means for converting said analog signals into audible sound;

memory control means for selecting said memory addresses in said sequence for readout to said digital/analog converter, said memory control means being adapted to select said addresses at at least two rates, said rates being dependent upon signals to said memory control means derived from said divider network;

external control means for inputing signals to said memory control means for selecting a rate for address selection, onestate of said external control means producing a first address selection rate, another state of said external control means producing a second address selection rate, the time for complete reading of said memory addresses being less at the higher address selection rate than at the lower address selection rate;

input means for receiving externally generated audible sounds and generating analog signals corresponding thereto;

an analog/digital converter for receiving said analog signals and outputting digital data corresponding thereto; and

switch means for selecting between reading data from said memory addresses or writing data into said memory addresses, said switch means in one state directing said input analog signal to said analog/digital converter, and in another state directing the output of said digital/analog converter to said output means for converting analog signals into audible sound, said analog/digital converter inputting data to said memory addresses selected by said memory control means at one of said rates of said memory control means for selecting memory addresses, said external control means being adapted to determine the state of said switch means for either input or output.

4,508,458

ELECTRIC CLOCK MOVEMENT, PARTICULARLY A QUARTZ CLOCK MOVEMENT

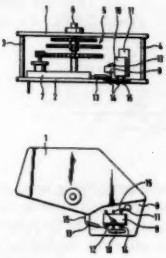
Horst Schlick, Schwalbach; Paul Höfert, Frankfurt am Main, and Rudolf Caramel, Hofheim-Diedenbergen, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 21, 1983, Ser. No. 459,869

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207616

Int. Cl.³ G04B *19/00*

U.S. Cl. 368—76 **4 Claims**



1. In an electric clock movement, particularly a quartz clock movement, having a gear train which is driven by an electric motor and arranged bertween two plates, at least one of which consists of plastic, as well as an electric circuit containing electronic components for the time-dependent driving of the motor, the improvement comprising

an extension developed on only one of the plastic plates extending beyond the other plate, and wherein

said electronic components have their connection leads connected directly to each other, so as to form the electric circuit, and connected to said extension wherein;

said extension is formed with an array of holes located for receiving the connection leads, the leads being inserted into said holes for their connection to each other and connection with said extension; and wherein

the diameter of each said holes is of such a size that said connection leads which are brought together within a given said hole are held with a clamped fit therein, said holes constituting sole means for supporting and connecting said electrical components without any additional mechanical and electrical connecting and supporting means.

4,508,459

CLOCK HAVING A ROTATIONALLY DISPLACEABLE CLOCK MOVEMENT

Masao Hashimoto, and Katsumi Kato, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

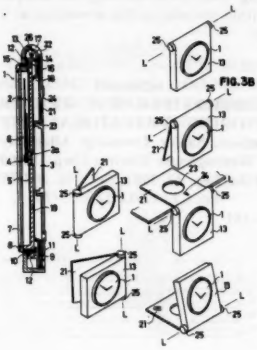
Filed Jul. 22, 1982, Ser. No. 400,709

Claims priority, application Japan, Aug. 4, 1981, 56-116070[U]

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—276 **8 Claims**

1. A clock comprising: a clock unit having means for keeping and displaying time; a case having front and rear case portions connected together to define an integral case structure; means mounting the clock unit in the case to undergo angular displacement relative to the case about an axis which extends generally transversely of the front and rear case portions to enable the case to be angularly displaced relative to the clock unit about the aforesaid axis to different positions of use corresponding to different modes of use of the clock; and a plate member pivotably attached to the case and coacting



therewith to help support the case in different positions of use corresponding to different modes of use of the clock.

4,508,460

PROCESS AND APPARATUS FOR CONTINUOUS MEASUREMENT OF THE POUR POINT OF OIL

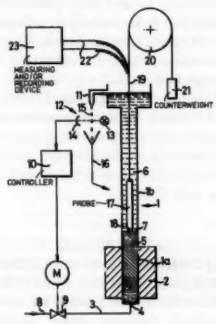
Robert J. Croo, Dubkerque, France, assignor to The British Petroleum Company p.l.c., London, England

Filed Feb. 9, 1983, Ser. No. 465,355

Claims priority, application France, Feb. 11, 1982, 82 02261

Int. Cl.³ G01N *25/04*

U.S. Cl. 374—16 **7 Claims**



1. A process for continuously measuring the pour point of oil comprising

A. introducing a continuous flow of an oil sample into a substantially vertical tube, which tube has smooth internal surfaces and a substantially constant bore, the liquid oil being introduced in the lower portion of the tube at a pressure which is sufficient to cause the oil in the tube to move upwards through the tube and out via an outlet in the upper portion of the tube;

B. cooling the oil as it moves upwards through the lower portion of the tube, by cooling means associated with the lower portion of the tube, to a temperature below the pour point of the oil so that the oil solidifies;

C. increasing the temperature of the oil as it moves upwards through the upper portion of the tube to a temperature sufficiently above the pour point of the oil so that the solidified oil becomes liquid again thereby forming a solid/liquid interface in the tube;

D. positioning a temperature sensing means at the solid/liq-

uid interface to provide a continuous signal, representing the pour point of the oil sample at the interface, to a measuring and/or recording device and

E. providing means for moving the temperature sensing means within the tube so that it remains at the solid/liquid interface.

4,508,461

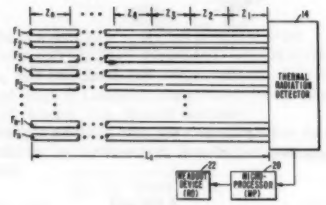
DISTRIBUTED FIBER OPTIC TEMPERATURE MONITORING APPARATUS AND METHOD

James L. Lambert, Shaler Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 22, 1981, Ser. No. 304,761

Int. Cl.[3] **G01J** *5/01, 5/10*

U.S. Cl. 374—161 **8 Claims**



1. An apparatus for determining the temperature distribution of an environment adjacent said apparatus, comprising:

a plurality of optical fibers associated in a cable arrangement having a first and a second end, each of said fibers extending an essentially identical distance between said first end and any preselected location on said cable, each of said fibers responding to said temperature of said environment by emitting thermal radiation independent of external light sources, each of said fibers selected to have an absorption constant which is measurably distinct from every other fiber in said cable;

means, operatively coupled to said first cable end, for measuring said thermal radiation generated by said fibers; and

means for mathematically deriving said temperature distribution by solving a plurality of simultaneous equations which are related to said measured thermal radiations emitted by said fibers.

4,508,462

PRINTING APPARATUS WITH COMPUTER CONTROL OF IMPRESSING A PRINT SETTING MARK ON A RECORDING SHEET FOR REALIGNMENT

Kazuyoshi Haruhara, Futsusa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 402,762, Jul. 28, 1982, abandoned. This application Mar. 8, 1984, Ser. No. 587,388

Claims priority, application Japan, Sep. 25, 1981, 56-142249[U]

Int. Cl.[3] **B41J** *3/42*

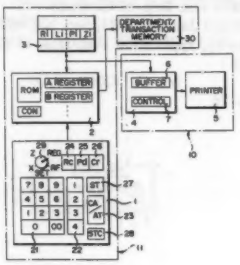
U.S. Cl. 400—70 **7 Claims**

1. A printing apparatus for enabling a setting mark to be impressed on a recording sheet, comprising:

keyboard means including at least numerical keys for inputting numerical data, and a subtotal-closing key for indicating the end of the input of the numerical data;

a central processing unit connected to the keyboard means and including first memory means for storing the numerical data entered by operation of said numerical keys, and second memory means for storing a first instruction for feeding the recording sheet a pre-determined distance after numerical data is transferred from said first memory means and in response to operation of said subtotal-closing key, and a second instruction for printing a setting mark on the recording sheet only after the recording sheet is fed said pre-determined distance; and

printing means connected to the central processing unit, said printing means including a printer for imprinting the numerical data and the setting mark on the recording sheet, buffer means for storing the numerical data transmitted



from said central processing unit, and control means for controlling said printer to print the numerical data and for causing the setting mark to be printed in response to said first instruction after the recording sheet is fed said pre-determined distance relative to said printer in response to said second instruction.

4,508,463

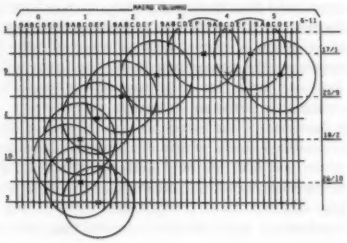
HIGH DENSITY DOT MATRIX PRINTER

An Wang, Lincoln, and Phillip P. Brown, Lawrence, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Nov. 1, 1982, Ser. No. 438,184

Int. Cl.[3] **B41J** *3/10*

U.S. Cl. 400—124 **8 Claims**



1. A method for printing a sequence of characters using a compacted character code for controlling the operation of the print pins of a dot matrix printer print head to print characters on a piece of material, where each print pin is actuated in sequence to print dots along an individual row and collectively the dots printed by all print pins of the print head print characters in character blocks while the print head and material are moved relative to each other, said character blocks being divided into rows and columns of dot positions in selected ones of which dots are printed by said print head to print a character, and comprising the steps of:

(a) generating a first sequence of codes each specifying a different number of macro columns that are not to have a dot printed therein;

(b) generating a second sequence of codes each specifying a different one of the micro columns within a macro column at which a dot is to be printed, where in each row of dots in each character block a predetermined number of adjacent dots are grouped to create said macro columns, and each dot in one of said macro columns falls in a micro column; and

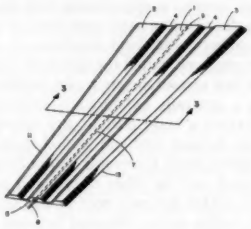
(c) specifying a combination of ones of said first sequence of codes and ones of said second sequence of codes for each print pin of said print head, where the code combinations for all print pins define the dots used to print a character, and the combination of codes for all print pins is used to control the operation of said print head pins to print dots defining a character.

4,508,464

FOLDABLE PEN

Michael F. Money, 85 Homestead Ave., Bridgeport, Conn. 06605

Filed Mar. 14, 1983, Ser. No. 450,911
Int. Cl.³ B43K 19/00, 7/00
U.S. Cl. 401—6 **8 Claims**



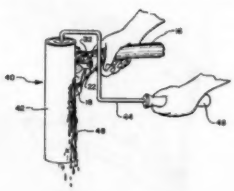
1. A foldable pen comprising,
(a) a substantially flat material of substantially quadrilateral shape, molded such that there are formed two longitudinal depressions in said material, said depressions defining three panels and said depressions acting as hinges between said panels, such that the pen may assume two distinct shapes, either a virtually flat substantially quadrilateral object, or, when folded at its hinges, a prism;
(b) a hollow reservoir for storing and dispensing ink located in one of the panels, and
(c) a pen tip extending into the reservoir for dispensing the ink.

4,508,465

APPARATUS FOR CLEANING PAINT ROLLERS

J. Berkeley Orton, R.R. #1, Heyburn, Id. 83336

Filed Jan. 28, 1983, Ser. No. 461,961
Int. Cl.³ A46B 17/06; B08B 3/02
U.S. Cl. 401—11 **14 Claims**



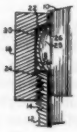
1. An apparatus attachable to an end of a hose for cleaning a paint roller and the like, said apparatus comprising:
a body, said body having an inlet formed in one end thereof and having means for connecting said inlet to said hose;
a first outlet formed in said body in fluid communication with said inlet, said first outlet comprising means for circumferentially engaging a portion of said paint roller and means for soaking and scraping said portion of the paint roller;
a second outlet formed in said body in fluid communication with said inlet, said second outlet comprising a nozzle for delivering a high pressure jet of water; and
means for controlling the flow of water from said hose through said first and second outlets.

4,508,466

LOCKABLE TELESCOPIC JOINT

Victor S. Dennis, 13342 Mango Dr., Del Mar, Calif. 92014

Filed Feb. 7, 1983, Ser. No. 464,626
Int. Cl.³ F16B 7/10
U.S. Cl. 403—104 **2 Claims**



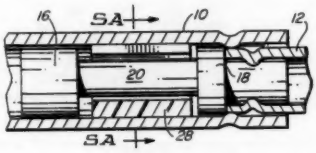
1. A rotationally adjustable lock nut assembly for locking the end of an outer tube to a telescoping inner tube to resist relative axial movement between the tubes while allowing relative rotational movement, comprising:
a nut having means to secure itself on the end of said outer tube;
said nut having a relieved interior defining a thread-free, smooth seating surface and an annular seating space adjacent said inner tube;
said seating space having one side defined by an inturned lip of said nut and another side defined by the end of said outer tube;
an annular bearing having a C-shaped longitudinal cross-section seated in said seating space and defining two sharp axially spaced annular edges at the end of the C directed toward and gripping said inner tube, and an outer rounded bearing side tangentially contacting and sliding against said seating surface when said tubes mutually rotate.

4,508,467

TELESCOPICALLY EXTENDABLE POLE

Justin C. Choffin, 211 El Nopal, Green Valley, Ariz. 85614

Filed Mar. 17, 1983, Ser. No. 476,213
Int. Cl.³ F16B 7/14; A01K 97/00
U.S. Cl. 403—104 **1 Claim**



1. A telescopically extendable pole comprising:
a. a first hollow cylindrical tube having an inner diameter;
b. a second cylindrical tube having a first end and an outer diameter smaller than the inner diameter of said first tube to permit telescopic displacements of said second tube within said first tube; and
c. means for selectively locking said first and second tubes together at a fixed relative position including:
i. a locking member including first and second cylindrical

end sections having aligned longitudinal axes and a diameter substantially equal to the inner diameter of said first tube to continuously frictionally engage the inner wall of said first tube along said end sections to thereby serve as a load bearing extension of said second tube within said first tube, said second end section being rigidly coupled to the first end of said second tube to transfer loads from said first tube to said second tube, said locking member further comprising a reduced diameter cylindrical center section positioned between said first and second end sections and having a longitudinal axis offset from the longitudinal axis of said first and second end sections to cause said center section to function as a first camming surface as said first tube is rotationally displaced with respect to said second tube; and

ii. a second camming member fabricated from a plastic material having a substantially cylindrical outer wall, a longitudinal axis aligned with the longitudinal axis of the first and second end sections of said locking member, and a substantially cylindrical inner wall with a longitudinal axis offset from the longitudinal axis of said outer wall, said inner wall having a second camming surface surrounding the center section of said locking member, said second camming member including an outer diameter substantially equal to the inner diameter of said first tube, said inner wall exceeding the diameter of said first camming surface to provide a low friction interface between said first and second camming surfaces, and a lengthwise notch located in the thinnest section of the wall of said second camming surface and extending along the entire length of said second camming surface, the outer wall of said second camming member being spring biased against the inner wall of said first tube to provide a circumferentially continuous high friction interface between the outer wall of said second camming member and the inner wall of said first tube;

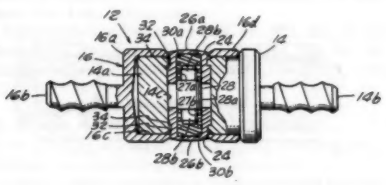
whereby rotational displacements of said first tube with respect to said second tube causes said first camming surface to immediately engage said second camming surface and said outer wall of said second camming member to further apply pressure to said friction interface with the inner surface of said first tube to lock said first and second tubes into a fixed relative longitudinal position.

4,508,468

LOCKING COUPLING

Lawrence F. Irwin, 12869 San Fernando Rd., Sylmar, Calif. 91342

Filed Sep. 28, 1982, Ser. No. 425,671
Int. Cl.³ F16B *12/20*
U.S. Cl. 403—328 **2 Claims**



1. A coupling for releasably interconnecting two elements such as sections of coiled spring, rod, or the like comprising:

(a) a first member having a cylindrical portion and an end portion formed to permit the attachment thereof to one of the elements to be interconnected, said cylindrical portion having a transverse bore extending therethrough;

(b) a second member having a cylindrical portion and an end portion formed to permit the attachment thereof to the other of the elements to be interconnected, said cylindrical portion having a cylindrical bore extending axially thereof defining a thin outer wall substantially annular shaped in cross-section along the length of said cylindrical portion, said outer wall having diametrically opposed apertures formed therein intermediate its length, said cylindrical bore being adapted to closely receive said cylindrical portion of said first member;

(c) first and second locking buttons partially carried within said transverse bore of said first member and being movable axially thereof, each of said first and second buttons having an axially extending bore, said buttons being located so as to be receivable within the apertures formed in the outer wall of said second member, when said cylindrical portion of said first member is inserted into the cylindrical bore formed in said second member;

(d) reinforcing means carried within said transverse bore of said first member in engagement with said first and second buttons for resisting axial separation of said first and second members when said members are mated with said buttons received within the apertures formed in the outer wall of said second member, said reinforcing means comprising a generally cylindrically shaped reinforcing element having a body portion and reduced diameter end portions, defining first and second shoulders, one of said end portions being receivable within the axial bore of said first button and the other of said end portions being receivable within the axial bore of said second button;

(e) a first coiled spring disposed between said reinforcing means and said first button for urging separation therebetween;

(f) a second coiled spring disposed between said reinforcing means and said second button for urging separation therebetween; and

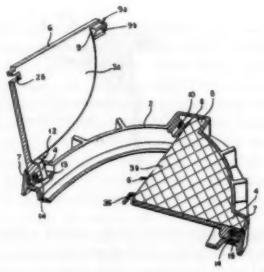
(g) interengaging means associated with said first member for limiting the extent of separation between said first and second buttons and said reinforcing means whereby the outer ends of the buttons are within the peripheral limit of the outer member in the general area of said opening therein, said parts of said coupling being so constructed and arranged as to allow the fingers of a hand to simultaneously depress said first and second buttons.

4,508,469

MANHOLE WITH ARTICULATED COVER MEMBERS

Robert Dumortier, 9 rue Duchartre, 34500 Beziers, France

Filed Jan. 11, 1983, Ser. No. 457,147
Claims priority, application France, Jan. 14, 1982, 82 00769
Int. Cl.³ E02D *29/14*
U.S. Cl. 404—25 **3 Claims**



1. A manhole structure comprising:

a circular frame formed with a pair of diametrically opposite inwardly and upwardly open pivot recesses and a pair of diametrically opposite upwardly and inwardly open support recesses at right angles to said pivot recesses, each of

said pivot recesses being spanned by a respective pivot pin; and

a pair of semicircular cover halves each having a rectilinear edge adjoining the rectilinear edge of the other cover half in a closed position of said covers, a radially projecting pivot lug received in the respective pivot recess and formed with a pocket traversed by the respective pin, and a slot of a width narrower than said pocket and narrower than at least a portion of the respective pin communicating with the respective pocket and enabling the respective pin to pass through the respective slot into the respective pocket in a selected angular position of the respective cover half and the respective pin, each of said cover halves being further formed with a pair of support lugs projecting along the respective edge and receivable in the respective support recesses, each of said lugs being provided with downwardly divergent inclined resting flanks and each of said recesses being provided with upwardly divergent inclined supporting flanks engageable with the resting flanks of a respective lug in a closed position of the respective cover half and supporting the three lugs of each cover half so that the respective pin is out of contact with the wall of the respective pocket, the pocket, the pin received therein and the pivot recess thereof being shaped so that each pocket forms a cam guiding the respective pivot lug along the respective wall at least during opening of each cover half so that each cover half is retained in a stable partially rearwardly inclined open position with said wall bearing against said pin and the respective pivot lug resting against the respective edge of the respective pivot recess in an open position of the respective cover half, said cam inducing radial displacement of each cover half relative to the frame during the opening of each cover half and the said pivot lug of each cover half being the sole pivot lug thereof.

4,508,470

MANHOLE/ACCESS COVER AND FRAME ASSEMBLIES

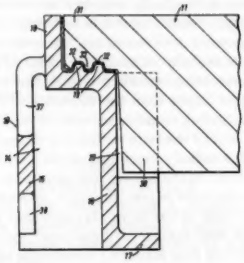
Derek Ferns, Monmouth, Wales, assignor to Selflevel Covers (Jersey) Limited, Jersey, Channel Islands

Filed Jan. 19, 1983, Ser. No. 459,096

Claims priority, application United Kingdom, Jan. 20, 1982, 8201582

Int. Cl.³ E02D *29/14*

U.S. Cl. 404—25 **4 Claims**



1. A cast iron frame, for a manhole/access cover and frame assembly, comprising outer peripheral portions which are generally of inverted U-shape in cross-section so as to provide inner and outer downwardly extending limbs, the outer limb of the U-shape being formed with a plurality of apertures which open in a direction away from the vertical and which constitute a major portion of the area of said outer limb so that the portions of the limb between the apertures form tangs which act as holding down lugs for the frame.

4,508,471

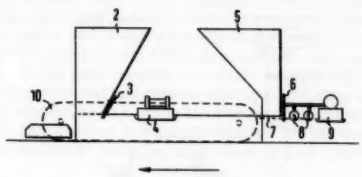
METHOD AND MACHINE FOR THE LAYERED PLACING OF CORE MATERIAL AND OF THE ADJACENT TRANSITIONAL MATERIAL FOR DAMS

Gerardus L. M. Mulders, 'S-Hertogenbosch, and Jacobus G. J. M. Hermans, Hedel, both of Netherlands, assignors to Bitumarin B.V., Netherlands

Filed Mar. 19, 1982, Ser. No. 360,084

Int. Cl.³ E02B *7/02*

U.S. Cl. 405—109 **6 Claims**



1. A method for the layered placing of upright or sloping dam cores for dams such as barrage dams, wherein the core material is bound with bitumen and/or plastic and/or a natural binder in a constant or upward-tapering thickness, comprising the steps of:

placing the core material and compacting the placed core material both vertically and laterally to effect pre-compaction of the core material;

placing transitional material against each lateral side of the placed and compacted core material; and

further compacting the core material and simultaneously compacting the transitional material.

4,508,472

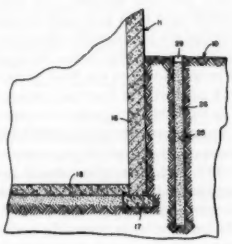
METHOD FOR CONTROLLING MOISTURE-EXPANSIVE CLAY SUPPORTING BUILDING FOUNDATIONS

Richard L. Handy, Ames, and James A. Murray, Des Moines, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 3, 1982, Ser. No. 438,782

Int. Cl.³ E02D *3/12, 31/10*

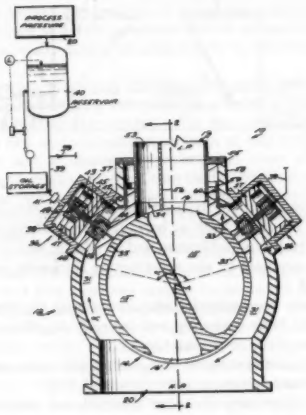
U.S. Cl. 405—229 **16 Claims**



1. A method for preventing or reducing the heaving of a floor slab and other damage to an existing building foundation that might result from the swelling of moisture-expansive clay beneath and about such foundation, comprising the steps of trenching along the sides of said foundation to form a vertical trench having a depth extending substantially below the floor slab of said foundation; and then substantially filling said trench with a mixture of hydrated lime and water to (a) help stabilize the moisture-expansive clay beneath and about said foundation and (b) provide a yieldable mass capable of upward displacement within said trench to accommodate horizontal expansion of the clay beneath and about said foundation,

thereby allowing lateral expansion of the clay below said floor slab and reducing upward pressure on said slab.

4,508,473
SIMPLE DRY FEEDER
Ole J. Richter, Karlstad, Sweden, and Erwin D. Funk, Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.
Filed Feb. 22, 1983, Ser. No. 468,674
Int. Cl.³ B65G 53/46
U.S. Cl. 406—64 **11 Claims**



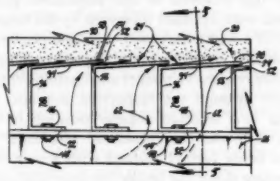
11. A low pressure feeder comprising: a rotor containing at least one pocket having a single access opening thereto, said rotor rotatable about an axis; a housing enclosing said rotor, said housing having an exterior periphery with an inlet port and an outlet port, each of said ports for registry with said access opening to said at least one pocket; means for mounting said rotor in said housing for rotation with respect to said ports about said given axis of rotation, and in a given direction; a large clearance volume being provided between said rotor and said housing; and sealing means disposed in said large clearance volume between said rotor and said housing; said sealing means consisting essentially of a single shoe means disposed between said rotor and said housing and having an opening communicating with said inlet port and in sealed engagement therewith; and means for biasing said shoe means into engagement with said rotor, comprising means for applying a force to said shoe means proportional to the fluid pressure adjacent the outlet port, which comprise at least one pressure compensator including a piston movable in a cylinder operatively attached to said housing, and operatively disposed between said housing and said shoe means, and operatively connected to a source of fluid under pressure; and connection means between said piston and said shoe means for providing continued operation of said pressure compensator as said shoe means wears, comprising a pair of balls, one sealingly rotatable with respect to each of said shoe means and said piston, and a tube interconnecting said balls.

4,508,474
AIR CONVEYOR FOR PARTICULATE MATERIAL
Charles V. Frederick, Rte. #5, New Virginia, Iowa 50219
Filed Jan. 21, 1983, Ser. No. 459,717
Int. Cl.³ B65G 53/16
U.S. Cl. 406—88 **4 Claims**

1. An air conveyor for particulate material comprising: elongated parallel conveyor support members,

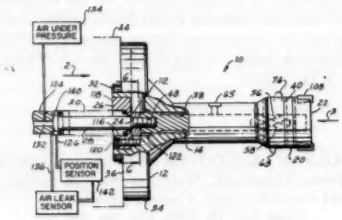
a plurality of channel shaped air deflectors mounted in juxtaposition on said support members, each of said air deflectors being in overlapping engagement with the next adjacent air deflector,

each of said air deflectors having a short lower flange adapted to be secured to said support members, an upper



flange generally parallel to and extending further in the same direction as said lower flange, and a web integrally interconnecting said upper and lower flanges to form a channel.

4,508,475
BORING AND GROOVING TOOL STRUCTURE AND METHOD
Bruce G. Peuterbaugh, Mt. Clemens, Mich., assignor to J. P. Tool, Mich.
Filed Oct. 1, 1981, Ser. No. 307,388
Int. Cl.³ B23B 7/00
U.S. Cl. 408—153 **6 Claims**



1. A boring and grooving tool comprising a body member having a multiple diameter bore therethrough, a boring and grooving tool actuating member positioned within the bore, slides positioned in the body member across one end of the bore therethrough, means operable between one end of the boring and grooving tool actuating member and slides for moving the slides radially on axial movement of the boring and grooving tool actuating member within the bore, a washer having a diameter larger than the diameter of the boring and grooving tool actuating member secured to the actuating member in the other end of the bore within one diameter of the bore cooperable with a radially extending surface within the bore to limit the movement of the boring and grooving tool actuating member within the bore in one direction, an end plate secured over said other end of the bore through said body member engageable with said washer to limit axial movement of the boring and grooving tool actuating member in the other direction, a recess in the end plate in the side thereof opposite the washer, a headed bolt extending through the end plate and washer and into the other end of the boring and grooving tool actuating member having an annular abuttment thereon engaged with the washer to secure the washer to the other end of the boring and grooving tool actuating member and resilient means positioned between the head of the bolt and the end plate within the recess therein for urging the washer into engagement with the end plate, the tool actuating member toward the other end of the bore therethrough and the slides into an extended position whereby the tool may be mounted

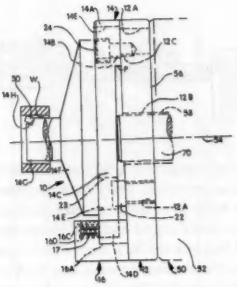
flush on a spindle of a machine tool and the head of the bolt engaged with a machine tool actuating member to move the slides radially outwardly on movement of the machine tool actuating member away from the bolt to move the washer toward the end plate.

4,508,476

ADJUSTABLE BORING TOOL

Shivdas A. Kalokhe, Clinton, Canada, assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 19, 1982, Ser. No. 369,855
Int. Cl.³ B23B *29/034*
U.S. Cl. 408—156 **10 Claims**



1. A boring tool attachable to a rotary spindle having a spindle axis and drawbar means movable toward and away from the spindle along the spindle axis, said boring tool being characterized as having a resilient tool-carrying member and means for attaching the tool-carrying member to the spindle, said tool-carrying member extending transversely of the spindle axis in cantilever fashion in the path of the drawbar means for direct engagement thereby to resiliently deflect said tool-carrying member away from the spindle to position a tool thereon in a radial workpiece-engaging position relative to the spindle axis terminating in a transversely extending tab movable therewith out of the path of the drawbar means, said tool-carrying member positioning the tool thereon in a radial retracted position closer to the spindle axis when deflecting engagement is released by virtue of the resiliency of said tool-carrying member causing movement thereof toward the spindle, said boring tool further having stop means fixedly positioned out of the path of the drawbar means including a stop wall disposed axially a preselected distance from the tool-carrying member on a side thereof oppositely disposed from said spindle and against which stop wall said tab abuts when said tool-carrying member is deflected for controlling deflection of said tool-carrying member.

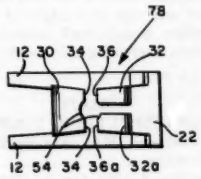
4,508,477

FASTENING DEVICE

Donald N. Oehlke, Troy, Mich.; Ralph A. MacRae, Burlington, Canada; James Crammond, Hamilton, Canada, and Hans R. Rattmann, Burlington, Canada, assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 430,449
Int. Cl.³ F16B *37/04*
U.S. Cl. 411—174 **13 Claims**

1. An improved fastening device (**70, 72, 74, 76, 78**) for securement with an externally threaded member ("S"), said device of the type having a base member (**12**), an aperture (**40**) through the base member for receiving the threaded member, thread engaging means defined by marginal portions (**16, 16*a***) of the aperture which extend outwardly from the base member for engagement with a lower surface (**62, 62*a***) of a thread of the threaded member when initially inserted through the aperture, a pair of resilient finger portions (**30, 32**) made integral with and extending upwardly and angularly inwardly from the base member on opposite sides of the aperture, said finger portions extending radially inwardly towards one another in overhanging relationship relative to the thread engaging means and having free-ends (**34, 36**) respectively thereof that are spaced-apart from each other along an axis ("y—y") defined therebetween and are axially off-set relative to one another such that the free-end of the one of the finger portions is higher than the free-end of the other finger portion relative to the base member, said thread engaging means including an upwardly projecting generally frusto-conical projection (**14**) defining upper and lower generally helical edges (**16, 16*a***) separated by a slot portion (**38**) formed radially relative to the aperture in the base member, said space between the finger portion free-ends and said base member aperture edges dimensionally adapted so that, upon turning the threaded member through the aperture, a force is imparted by the threaded member to intially draw the edges downwardly and axially



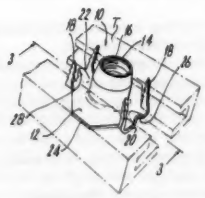
into engagement with the lower thread surface and pivot the finger portions radially inwardly into engagement with an upper surface (**60, 60*a***) of the threaded member so that a counter-force is imparted by the threaded member to pivot the finger portions in generally opposite directions and draw the edges downwardly and axially inwardly to urge the finger portions and the edges into tight gripping engagement with the root portions of the threaded member with the axial distance between corresponding axially aligned on the edges and the free-ends of the finger portions substantially greater than in the intially installed position thereof, said improvement characterized by the slot portion extending radially outwardly from the aperture along the base member and thence along the finger portion having the higher free-end relative the base member in a direction that is substantially transverse to the axis defined between the finger portion free-ends to provide the device with improved ability to receive and effectively secure the threaded-member without cocking or cross-threadably engaging the threads thereof.

4,508,478

TEE NUT FASTENER MEMBER

Herbert E. Leistner, Toronto, Canada, assignor to Sigma Tool & Machine Limited, Scarborough, Canada

Filed Jul. 11, 1983, Ser. No. 512,620
Int. Cl.³ F16B *39/00*
U.S. Cl. 411—176 **4 Claims**



1. A fastener member for use in an automatic fastener mem-

ber setting machine having a feed track, such fastener member comprising;

a base flange;

an integrally formed central sleeve perpendicular to such base flange, and having internal threads formed therein for reception of threaded fastening means;

a plurality of fastening teeth and extending generally normally from said base flange for reception in a wooden work piece, said base flange defining a forward feed edge and a rearward feed edge, and side feed edges, such side feed edges being adapted to be received in opposite sides of a feed track, with such forward feed edge of one such fastener member in engagement with the rearward feed edge of the next adjacent fastener member in such track, and,

abutment means formed in said base flange adjacent said forward feed edge and spaced apart from said fastening teeth, and further abutment means formed in such base flange adjacent such rear edge and spaced apart from said fastening teeth, such abutment means in one of said forward and rear feed edges being adapted to inter-engage with the abutment means or the feed edge of the other of such forward and rear feed edges of the next adjacent fastener members in such track, whereby to prevent such feed edges from overriding one another.

4,508,479

DEVICE FOR PULLING TOGETHER

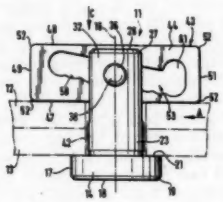
Georg Mez, Gartenstrasse 30A, 7416 Reutlingen Gonningen, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 299,731

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3126670

Int. Cl.³ F16B *19/00*

U.S. Cl. 411—340 **28 Claims**



1. In a fastener designed to be placed through two lined-up holes in members to be forced and held together, the fastener having:

a stem to be inserted through said holes, a head on said stem, said head being wider than said stem and having a shoulder adapted to rest against one of said members, said stem being coaxial with said head and made in one piece therewith, the shape of said stem being compatible with the shape of said holes in said members, and

a gripping keeper movably connected to said stem and having a working face turnable towards said shoulder on said head, said gripping keeper being movable in relation to said head for forcing said members together; the improvement wherein:

said stem has an opening extending therealong and a crosspiece running across said opening;

said gripping keeper comprising an elongated member projecting through said opening out to each side of said stem;

said gripping keeper having two generally parallel side faces, both of said faces comprising turnable working faces of said gripping keeper, and a narrow cutout extending along said gripping keeper, both sides of said cutout being at a small angle to said working faces and having a row of rest waves extending therealong;

said crosspiece in said stem being arranged to run through said cutout in said gripping keeper to hold said gripping keeper in position in said opening of said stem.

4,508,480

MANUFACTURE OF TINPLATE AND TINPLATE CONTAINERS

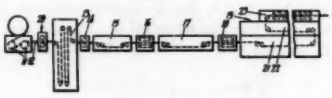
Dietmar F. E. Salm, Bulli, Australia, assignor to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Division of Ser. No. 228,375, Jan. 26, 1981, abandoned, which is a continuation of Ser. No. 13,917, Feb. 22, 1979, abandoned. This application Mar. 5, 1982, Ser. No. 355,186

Claims priority, application Australia, Mar. 29, 1978, PD3490

Int. Cl.³ B21D *51/26*

U.S. Cl. 413—1 **12 Claims**



1. In a method of producing a tinplate container comprising forming an annular container body from tinplate stock, flanging the container body at at least one end thereof and applying a container end to said flanged end, the improvement comprising using, as said tinplate stock, a steel sheet coated on at least one side, wherein the coating consists essentially of an electrolytic unreflowed tin coating having a coating mass of at least about 0.95 and less than 2.5 g/m^2.

4,508,481

PROCESS FOR PREPARATION OF METAL VESSELS

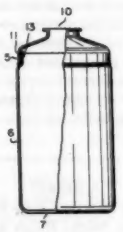
Kazuhisa Ishibashi, Tokyo; Hideo Kurashima, Yokosuka; Hisakazu Yasumuro, Yokohama; Michio Watanabe, Yokohama; Tsuneo Imatani, Yokosuka; Kazuo Taira, Tokyo; Seishichi Kobayashi, Yokohama, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 426,241

Claims priority, application Japan, Oct. 26, 1981, 56-170200

Int. Cl.³ B23P *11/02*

U.S. Cl. 413—1 **7 Claims**



1. A process for preparation of metal vessels, which comprises lap-bonding circumferential open end portions of outer and inner members, each consisting of a formed seamless metal cup, to each other through an adhesive, said process being characterized by fitting both the outer and inner members to each other through an adhesive layer interposed between the open end portions of both the members, heating the fitted portions of both the outer and inner members so as to melt the adhesive layer, and cooling the fitted portions so that the temperatures of the fitted portions of both the outer and inner members are substantially equal to each other just before solid-

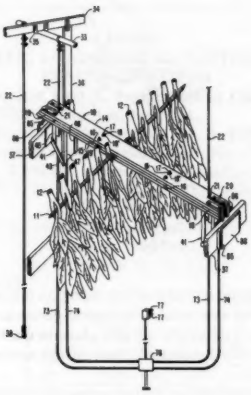
ification of the adhesive layer and the adhesive is filled between both the open end portions.

4,508,482

METHOD AND APPARATUS FOR HARVESTING TOBACCO

George A. Duncan, Lexington, Ky., assignor to University of Kentucky Research Foundation, Lexington, Ky.

Filed Feb. 25, 1983, Ser. No. 469,704
Int. Cl.[3] A24B *1/08*
U.S. Cl. 414—26 6 Claims



4. A hoist for use in raising and lowering a support beam having tobacco sticks supported thereby with the tobacco sticks having tobacco thereon including:

frame means;

a drum rotatably supported by said frame means;

said drum having attachment means for attachment to the lower end of a cable attached in the upper end of a barn and passing through the support beam;

said frame means having means for engaging the support beam to raise and lower the support beam after said attachment means is attached to the cable passing through the support beam;

rotating means to rotate said drum in either direction, said frame means supporting said rotating means;

said frame means having its bottom end formed at an angle to clear any rail support during raising and lowering of the support beam;

said engaging means of said frame means including means to allow the cable to pass therethrough for attachment to said attachment means of said drum;

said engaging means of said frame means including a plate; and said allowing means of said engaging means being an opening in said plate.

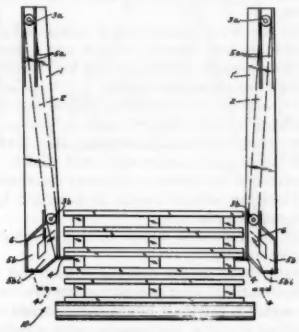
4,508,483

LIFTING DEVICE FOR A MAGAZINE FOR EMPTY PALLETS IN AN AUTOMATIC PALLETIZING MACHINE

Heinz W. Hessling, Beckum, and Gottfried J. Weykam, Hesslerstrasse 14, 4700 Hamm 1, both of Fed. Rep. of Germany, assignors to Gottfried J. Weykam, Hamm, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,075
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210547
Int. Cl.[3] B65G *59/06*
U.S. Cl. 414—127 2 Claims

1. A lifting device for a magazine for empty pallets stacked therein, formed with two opposite walls, and comprising two frames each mounted in a respective opposite wall of the magazine and vertically movable upwardly and downwardly to lift overlying pallets from a lowermost pallet in the magazine; each of said frames having an upper end and a lower end in the region of the pallets contained in said magazine and being provided with an upper roller at the upper end thereof and a lower roller at the lower end thereof and with a gripper engageable with a pallet in said magazine when said frames are moved upwardly; two opposite upper rails each being rigidly secured to one of the opposite walls and guiding the respective upper roller during the upward and downward movement of said frames; two opposite lower rails each being rigidly secured to one of the opposite walls and guiding the respective



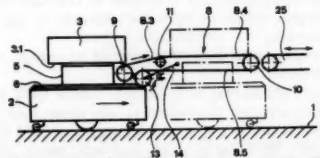
lower roller during the upward and downward movement of said frames, each of said lower rails including a bend forming a curved track for the respective lower roller, the tracks of the lower rails positioned on said opposite walls being inclined in opposite directions with respect to the pallets in said magazine; and switch means provided in each bend in an upper region thereof for guiding the respective lower roller along the respective track in said upward and downward movement such that in said downward movement of said frames said grippers are disengaged from the pallets and moved laterally away therefrom and in said upward movement of said grippers engage a second lowermost pallet from below and lift the underlying pallets from the lowermost pallet in said magazine.

4,508,484

INSTALLATION FOR THE AUTOMATIC REMOVAL AND RECEPTION OF LOADS THROUGH THE INTERMEDIARY OF TRANSPORT VEHICLES

Ulrich Heiz, Säriswil, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

PCT No. PCT/CH81/00109, § 371 Date Jun. 1, 1982, § 102(e) Date Jun. 1, 1982
PCT Filed Sep. 30, 1981, Ser. No. 387,844
Claims priority, application Switzerland, Oct. 21, 1980, 7830/80
Int. Cl.[3] B65G *67/00*
U.S. Cl. 414—337 16 Claims



1. A transport installation for automatic displacement of loads, comprising:

at least one driveable transport vehicle;
at least one reception station defining a load transfer side;
said at least one transport vehicle being driveable for substantially horizontal displacement in two opposing directions for load transfer at said at least one reception station;
said at least one driveable transport vehicle being equipped with load support means defining a substantially horizontal plane for a load to be transported by said driveable transport vehicle;
said at least one transport vehicle comprising a conveyor drive element extending thereat in the direction of said substantially horizontal displacement;
said at least one reception station comprising a stationary frame and an endless conveyor supported at said stationary frame;
said endless conveyor comprising a substantially horizontally extending load bearing portion and a downwardly inclined load transfer portion on said load transfer side of said at least one reception station;
said load transfer portion extending below said horizontal plane defined by said support means at said at least one driveable transport vehicle; whereby said load may be lifted off said support means when said vehicle travels in a first horizontal direction or delivered onto said support means when the vehicle travels in a second horizontal direction opposite the first;
said at least one reception station further comprising conveyor drive means;
said conveyor drive means defining a first end which is drivingly connected to said endless conveyor and a second end which is drivingly connectable to said conveyor drive element at said at least one driveable transport vehicle; and
said conveyor drive element at said at least one driveable transport vehicle being drivingly connected to said second end of said conveyor drive means during the load transfer at said at least one reception station in a preselected one of said two opposing directions of substantially horizontal displacement of said at least one driveable transport vehicle in order to drive said load transfer portion and said load bearing portion of said endless conveyor at said at least one reception station in the same direction and at the same speed as said at least one transport vehicle is driven.

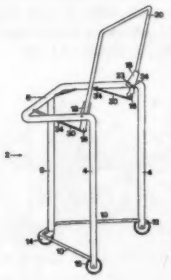
4,508,485

LIFTING DEVICE

Jerry Mlinaric, 8 Highland Ct., Dandenong, Victoria; William Leary, Sheldon Padonstor Rd., Emerald, Victoria, and Robert J. Mummery, Noble Park, all of Australia, assignors to Jerry Mlinaric, Dandenong and William Leary, Emerald, both of, Australia

PCT No. PCT/AU81/00050, § 371 Date Jun. 29, 1983, § 102(e) Date Jun. 29, 1983, PCT Pub. No. WO81/03310, PCT Pub. Date Nov. 26, 1981
PCT Filed May 6, 1981, Ser. No. 339,457
Claims priority, application Australia, May 21, 1980, PE3665
Int. Cl.³ B62B *3/04, 3/06*
U.S. Cl. 414—458 **14 Claims**

1. A device for lifting an article, said device comprising:
(a) a mobile frame (2) having two forward uprights (4) connected at their upper ends by an upper support bar (8) and at their lower ends by a lower support bar (10), said support bars being generally U-shaped so that said two forward uprights define an open face adapted in use to receive the article;
(b) a pair of engagement members adapted to engage the article to be lifted;
(c) an actuator (18) having a U-shaped handle (20), the actuator being pivotally connected to said upper support bar of the frame about a first axis located near said forward uprights, said engagement members being connected to said actuator for pivotal movement relative thereto about a second axis, said actuator being rotatable by the handle between a first position where the article is not engaged and a second position where the article is in use engaged in which, in the first position, said engagement members are at a first level relative to the frame and said second axis is located at a first lateral position relative to said first axis, and, in the second position, said engagement members are at a second level, vertically higher than said first level, relative to the frame and said second axis is located at a second lateral position relative to said first



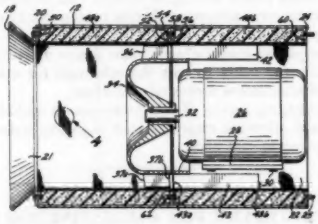
axis, said second lateral position being on the opposite side of said second axis to said first lateral position, said handle extending in a generally upright plane in the first position and a generally horizontal plane in the second position; and
(d) abutment means (8) to restrain movement of said actuator beyond its second position, and wherein in use, an article is supported by said engagement members and the weight thereof tends to rotate said actuator into engagement with said abutment means.

4,508,486

VENTILATION FAN WITH NOISE-ATTENUATING HOUSING

Charles L. Tinker, Dover, Ohio, assignor to Peabody ABC Corporation, Warsaw, Ind.

Filed May 28, 1982, Ser. No. 383,112
Int. Cl.³ F01D *5/26*
U.S. Cl. 415—119 **5 Claims**



1. In a ventilation fan, of the type having a rotor with circumferentially spaced blades and means for driving said rotor, an improved housing structure, comprising:
a substantially cylindrical, perforated inner casing some of whose perforations said rotor and drive means therefor spaced radially from the distal ends of said blades;
a substantially cylindrical, substantially continuous outer casing concentrically surrounding said inner casing so as to define a substantially annular intercasing space between said inner and outer casings;
a porous, sound-absorbing medium substantially filling said intercasing space along substantially the entire length

thereof for exposure to air moving through said space near said distal ends of said blades; and

relatively thin annular barrier means intermediate the ends of said casings within said space adjacent said inner casing and in abutting relation to said sound-absorbing means on either side thereof, said barrier means extending from said inner casing to said outer casing to block the flow of air parallel to the length of said fan through said space adjacent said distal blade ends while enabling said sound-absorbing medium in abutting relation thereto to engage air flowing radially through said perforated inner casing from said blades.

4,508,487

AUTOMATIC LOAD SEEKING CONTROL FOR A PUMPJACK MOTOR

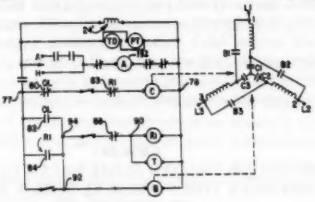
Noel R. Taylor, and Paul A. Taylor, both of Odessa, Tex., assignors to CMD Enterprises, Inc., Tex.

Continuation of Ser. No. 156,740, Jun. 5, 1980, Pat. No. 4,446,415, which is a continuation of Ser. No. 27,798, Apr. 6, 1979, Pat. No. 4,200,440, which is a continuation-in-part of Ser. No. 854,389, Nov. 23, 1977, abandoned. This application Oct. 26, 1983, Ser. No. 545,758

The portion of the term of this patent subsequent to Sep. 2, 1997, has been disclaimed.

Int. Cl.[3] **F04B** *49/06, 35/04*

U.S. Cl. 417—12 **9 Claims**



1. A motor control unit for automatically controlling the torque output of a high slip motor powering a pump jack unit for stroking a downhole pump, said motor including motor starter means connected to motor stater windings and circuit means for altering the electrical configuration of said stater windings, said motor control unit comprising:

sensor means for detecting the magnitude of the average current flow through said starter windings during a multiplicity of pump strokes;

said stater windings being electrically connected in a first electrical configuration for a relatively lower motor torque output;

first overload means responsive to said sensor means for automatically altering the electrical configuration of said motor windings from said first electrical configuration to a second electric configuration when said average current flow exceeds a first preselected value to increase said motor torque output;

first timing means for sensing the time period said stater windings are connected in said second electrical configuration and automatically altering said motor stater windings from said second electrical configuration to another electrical configuration to reduce said motor torque output after a preselected period of time.

4,508,488

WELL PUMP CONTROLLER

Richard G. Pikna, Mineral City, Ohio, assignor to Logan Industries & Services, Inc., New Philadelphia, Ohio

Filed Jan. 4, 1984, Ser. No. 568,098

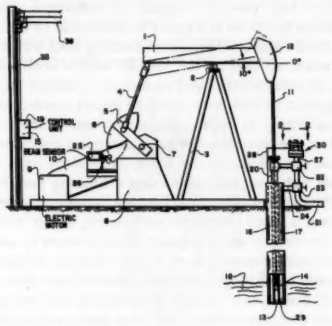
Int. Cl.[3] **F04B** *49/00*

U.S. Cl. 417—12 **14 Claims**

1. A well pump controller for a well of the type having a well casing and a positive displacement pump located within a delivery tube within said well casing, and in which the displacement pump is actuated by a power driven walking beam, said controller including:

(a) position sensing means for sensing the walking beam when at a predetermined position of its pumping stroke;

(b) first signal means generated by the position sensing means upon the walking beam reaching the predetermined position;



(c) pressure differential sensing means for sensing a predetermined pressure differential between the casing pressure and delivery tube pressure;

(d) second signal means generated by the pressure differential sensing means upon the pressure differential reaching a predetermined amount; and

(e) control means responsive to said first and second signal means for maintaining the walking beam energized to continue the pumping operation.

4,508,489

FUEL INJECTION PUMPS

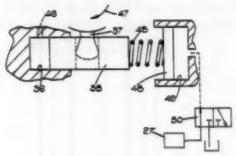
Peter Howes, Gerrards Cross, England, assignor to Lucas Industries public limited company, Birmingham, England

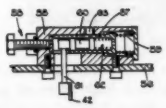
Filed Dec. 20, 1983, Ser. No. 563,377

Claims priority, application United Kingdom, Jan. 11, 1983, 8300638

Int. Cl.[3] **F04B** *19/02, 49/00;* **F02M** *59/20*

U.S. Cl. 417—221 **2 Claims**





1. A rotary distributor type fuel injection pump for supplying fuel to compression ignition engines and including a pumping plunger slidable in a bore, a cam for effecting inward movement of the plunger thereby to displace fuel from the

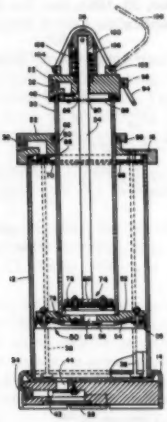
bore to an outlet, throttle means for controlling the admission of fuel to the bore, said throttle means including an angularly adjustable throttle member, a fluid pressure operable timing piston coupled to said cam for varying the timing of fuel delivery by the pump through said outlet, a fluid pressure operable control piston which in its operative position has the effect at least at low engine speeds, of causing said timing piston to effect advance of the timing of fuel delivery, valve means for controlling the application of fluid pressure to said control piston, governor means for controlling the setting of said throttle member, said governor means comprising a centrifugal weight which is driven at a speed proportional to the speed of the associated engine, a linkage connecting said weight to said throttle means so that as the weight moves with increasing speed the throttle member will be moved to reduce the amount of fuel supplied to said bore, resilient means connected to said linkage and acting to oppose the movement of the weight as the speed of the associated engine increases, operator adjustable means for adjusting the force exerted by said resilient means, said valve means comprising a housing part to be secured to the exterior of a pump housing, a sleeve located in the housing part, a spool slidable in said sleeve, a pair of lands on said spool having an annular space therebetween in communication with said control piston, a pair of ports in said sleeve, said ports and annular space be- connected in a flow path to said control piston, one of said lands during movement of the spool in one direction closing said flow path, and an arm connected to said spool, said arm projecting into the pump housing and engaging with a part of said linkage, whereby the application of fluid pressure to said control piston will depend upon the setting of said throttle member.

4,508,490

TWO STAGE MANUAL AIR PUMP

Joe D. Ramirez; Steven E. Gorin, both of Panama City, and William A. Garnett, Panama City Beach, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 10, 1984, Ser. No. 569,646
Int. Cl.³ F04B *21/04, 25/02*
U.S. Cl. 417—234 **1 Claim**



1. A selective volume hand pump operable alternatively as a low pressure pump and as a high pressure pump, said pump comprising:

a large diameter pump cylinder having a large diameter end cap;

a small diameter cylinder having a small diameter end cap, said small diameter cylinder being reciprocable in said large diameter cylinder and carrying a large diameter plunger;

a small diameter plunger reciprocable in said small diameter cylinder; and

a handle and shaft attached to said small diameter plunger, said shaft extending through said small diameter end cap; and

operation selecting means for causing said small diameter cylinder and large diameter plunger to reciprocate with said handle relative to said large diameter cylinder during operation as a low pressure pump and for securing said small diameter cylinder and large diameter plunger against reciprocation in said large diameter cylinder during operation of said pump as a high pressure pump, said operation selecting means comprising first latch means operable between said small diameter cylinder and said handle for releasably connecting said handle and said small diameter cylinder together, second latch means operable between said small diameter cylinder and said large diameter cylinder for releasably connecting thereof together,

said first and second latch means comprising first and second wire bail elements, respectively,

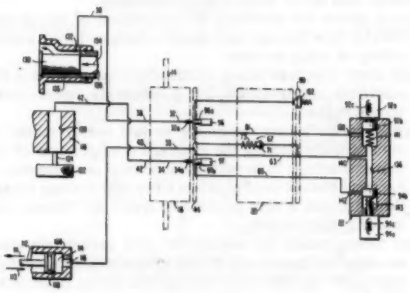
said first latch means comprising a first wire bail element pivoted on said small diameter end cap for swinging movement over said handle into and out of a handle securing position, a first hook member projecting from said small diameter end cap and engagable by said first wire wire bail element when in said handle securing position, said second latch means comprising a second wire bail element pivoted on said small diameter end cap and a second hook member projecting from said large diameter end cap and engagable by said second wire bail element.

4,508,491

MODULAR UNLOAD SLIDE VALVE CONTROL ASSEMBLY FOR A HELICAL SCREW ROTARY COMPRESSOR

Donald D. Schaefer, Farmington, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Dec. 22, 1982, Ser. No. 452,231
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—310 **6 Claims**



1. In combination, a hermetic helical screw rotary compressor for a closed loop refrigeration system or the like, having refrigerant circulating therein, said compressor comprising:

a hermetic outer casing receiving the discharge of the compressor,

an inner casing defining with a pair of intermeshed helical screw rotors rotatably mounted therein, a compressor compression chamber,

a suction port within said inner casing opening to said compression chamber,

a capacity control slide valve hydraulic cylinder mounted to

said inner casing and including a piston for shifting a slide valve slidably and sealably mounted within said hydraulic cylinder and defining with said cylinder a closed chamber,

a compressor suction tube connected to the closed loop system for supplying refrigerant in vapor form to the suction port of the compressor,

oil for lubricating and sealing purposes within the outer compressor casing and being subject to the discharge pressure of the compressed refrigerant vapor,

a first tube in communication with the oil within compressor outer casing sump for providing a supply of oil as hydraulic fluid at discharge pressure and partially forming a first line,

a second tube connected to said hydraulic cylinder for supplying said hydraulic fluid to said cylinder and for removing said hydraulic fluid therefrom and partially forming a second line,

a third tube connected to the compressor suction tube for returning working fluid to the suction port of the compressor and partially forming a third line,

an unload rate needle valve within said third line,

a load rate needle valve within said first line, and

solenoid valve means selectively connecting or disconnecting ones of said first and second and third lines,

the improvement comprising:

a modular, multi-block unloading control valve assembly, said assembly comprising:

a compressor block fixedly and sealably mounted within the hermetic compressor outer casing and having internal and external faces,

said compressor block including holes extending through the same forming parts of said first, second and third lines and being connected to ends of said first, second and third tubes respectively so as to maintain the exposed tubes internally of said hermetic compressor outr casing.

a needle valve block fixedly mounted to the external face of the compressor block,

said needle valve block including passages extending therethrough, one of said passages carrying a pressure relief valve and others said unload rate needle valve and said load rate needle valve, respectively,

and said solenoid valve means comprising a solenoid valve block fixedly mounted in face abutting position on said needle valve block, forming a three way solenoid valve and comprising a normally open unload plunger, a normally closed load plunger and passages opening to said plungers and connected to respective passages carried by said needle valve block,

and means for removably, sealably fixing said blocks in a stacked array in end facing position includig means for fluid connecting respective passages of said blocks at their interfaces, such that said fluid passages internal of said compressor block, said needle valve block and said solenoid valve block insure minimum viscosity to the oil carried thereby as a result of compressor shut down for insured prompt proper slide valve operation at compressor start up.

4,508,492

MOTOR DRIVEN FUEL PUMP

Yukio Kusakawa; Toshiaki Nakamura, both of Anjo; Yoshifumi Ina, Okazaki, and Takashi Inbe, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 29, 1982, Ser. No. 445,222

Claims priority, application Japan, Dec. 11, 1981, 56-200680; Jan. 12, 1982, 57-3956

Int. Cl.[3] **F04B** *17/00;* **F04D** *5/00*

U.S. Cl. 417—366 **4 Claims**

1. A motor driven fuel pump comprising:

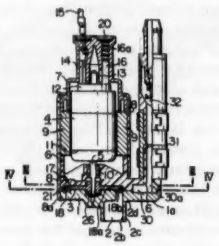
a cylindrical motor housing made of metal;

a motor armature rotatably disposed in said motor housing;

a pump housing secured to an end of said motor housing and defining a pump chamber;

an impeller of regenerative pump type disposed in said pump chamber and rotatably journalled by said pump housing, said impeller being drivingly connected to said motor armature and having an outer peripheral section cooperating with a radially outer peripheral section of the inner surface of said pump chamber to define a fuel pressurizing passage extending in the circumferential direction of said impeller;

said pump housing being formed therein with a suction port having an axis substantially parallel to the axis of said motor armature and communicated with said fuel pressurizing passage adjacent to one end thereof;



said pump housing being further formed therein with a discharge port communicated with said fuel pressurizing passage at the other end thereof and extending therefrom substantially tangentially thereto, said discharge port having a cross-sectional area which increases from its upstream end toward the downstream end; and

a discharge pipe connected to the downstream end of said discharge port and having an axis substantially parallel to the axis of said motor armature;

said impeller having a central section;

said impeller central section, said suction port and the downstream end of said discharge port being disposed on a substantially straight line; wherein

said motor housing has a plurality of circumferentially spaced tabs bent radially inwardly over said pump housing to secure the same to said motor housing.

4,508,493

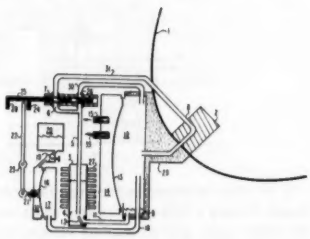
SELF ACTUATING DIAPHRAGM PUMP

Louis R. O'Hare, 1700 Banyan #3, Fort Collins, Colo. 80526

Filed Feb. 28, 1983, Ser. No. 476,024

Int. Cl.[3] **F04B** *17/00*

U.S. Cl. 417—379 **10 Claims**



1. A self actuating diaphragm pump comprising:

(1) A vapor pressure to fluid flow conversion means in the form of multiple enclosed chambers having a common side which is in the form of a diaphragm capable of enlarging the volume of either one of the chambers while con-

tracting the volume of the other by expansion from the direction of the enlarging chamber and extension into the contracting chamber, one of said chambers being a pump chamber with two check valves for receiving and expelling the fluid being pumped and the second of said chambers having multiple inlet and exit ports, one port being capable of admitting heated vapor, another of admitting cool fluid for vapor condensation, and a third of exiting condensed and cooling liquids, and in addition said second chamber being capable of providing pressurization and vacuum conditions, and (2) fluid flow heating and vaporization means in the form of heat transfer ducting extending through strongly heated thermal mass, and (3) fluid flow cooling means in the form of a cooling duct connected to and extending through a cooler, and (4) internal liquid circulation means in the form of a pressurized liquid storage tank capable of receiving liquid under pressure through ducting connected to a liquid exit port at the bottom of said second chamber of the vapor pressure to fluid flow conversion means and of thereby compressing a gas above the liquid level and of subsequently exiting liquid under pressure from below the liquid level in the liquid storage tank through ducting connected to said storage tank below the liquid level thereof and of delivering said liquid under pressure to an (5) alternating fluid flow communication means in the form of valving and ducting capable of providing fluid flow communication between said second chamber of the vapor pressure to fluid flow conversion means, said cooling means and said circulation means in one time period and then between said second chamber of the vapor pressure to fluid flow conversion means, said heating means and said circulation means in an alternate period.

4,508,494

TWO STAGE ROTARY VANE PUMP

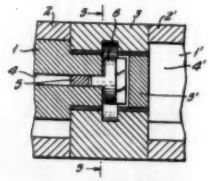
Erich Bachmann, Asslar; Ludwig Fabel, Wetzlar; Roland Fischer, Wetzlar; Werner Peter, Wetzlar; Bernd Schelter, Vollnkirchen, and Werner Wenzel, Schöffengrund, all of Fed. Rep. of Germany, assignors to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Asslar, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 426,201

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139232

Int. Cl.[3] **F04C** *23/00*

U.S. Cl. 418—13 **2 Claims**



1. A rotor arrangement for use in a two-stage rotary vane pump, having a first rotor of one stage and a second rotor of the other stage, and a coupling element located between said first and second rotors and in driving relationship therewith, said element forming between engagements on opposed faces of the two rotors a connection which permits two degrees of freedom between the two rotors in the plane perpendicular to the rotor axis, a groove in a face of one of the rotors, in which the coupling element engages, is formed by the axial ends of the vane slits in said one rotor.

4,508,495

ROTARY SHAFT FOR COMPRESSOR

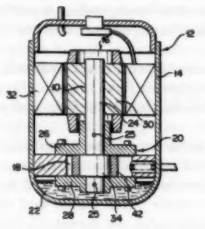
Tsuneo Monden, Tokyo; Masao Ozu, Fuji, and Satoshi Ikegami, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 30, 1983, Ser. No. 567,345

Claims priority, application Japan, Jan. 18, 1983, 58-6411

Int. Cl.[3] **F04C** *2/00;* **B23K** *26/00*

U.S. Cl. 418—63 **4 Claims**



1. A rotary shaft for a compressor which includes an outer box, driving means arranged within the outer box to drive the rotary shaft, and a compression section arranged within the outer box and having a compression chamber, comprising:

a cylindrical shaft body rotatably arranged within the outer box and connected to the driving means at one end portion thereof;

a cylindrical eccentric member having a through-hole extending along the axis thereof and formed eccentric thereto, and also having a groove extending from one end face to the other end face of the eccentric member to form a passage for lubrication oil, being provided with a bottom face adjacent to the shaft body, the shaft body being inserted into the through-hole and the eccentric member being secured to the other end portion of the shaft body by laser-welding the bottom of the groove to the shaft body, and being housed within the compression chamber; and

an annular eccentric roller arranged within the compression chamber and rotatably fitted onto the eccentric member to compress coolant within the compression chamber in accordance with the rotation of the shaft body.

4,508,496

ROTARY, POSITIVE-DISPLACEMENT MACHINE, OF THE HELICAL-ROTOR TYPE, AND ROTORS THEREFOR

James L. Bowman, Mooresville, N.C., assignor to Ingersoll-Rand Co., Woodcliff Lake, N.J.

Filed Jan. 16, 1984, Ser. No. 571,109

Int. Cl.[3] **F01C** *1/16*

U.S. Cl. 418—201 **22 Claims**

1. A rotor, having helical lobes, and intervening, helical grooves, rotatable about a given axis within a machine housing, for coacting, meshing engagement with a cooperating rotor also having helical lobes, and intervening, helical grooves, in order that fluid admitted into such housing will be received in said grooves and, due to coacting, meshing engagement and rotation of said rotors, will have the pressure thereof altered, wherein:

said rotor has an axial center;

each of said grooves of said rotor has, in cross-section, a pair of generally concave surfaces, and a first, radially innermost point intermediate said pair of surfaces;

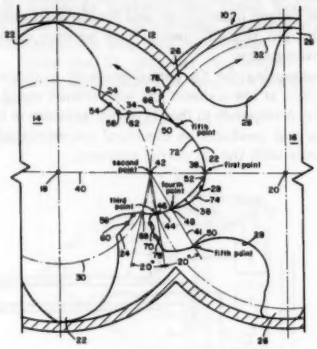
and

said rotor has a pitch circle; wherein

a line traversing said axial center and said first point further traverses a second, given point on said pitch circle;

only a minor portion of one of said concave surfaces is defined by a circular arc which (a) traverses said pitch

circle, and (b) has a given radius originating at said second point; and



said minor portion is bounded by a third point which is located on said pitch circle whereat said arc traverses, and a fourth point which is at a prescribed distance inward of said pitch circle.

4,508,497

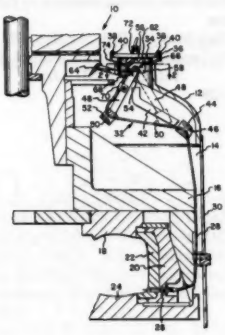
CABLE TAKE-UP FOR TIRE VULCANIZER

Arthur W. Beres, Springfield Township, Summit County, and Joseph P. Verderico, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 20, 1983, Ser. No. 543,875

Int. Cl.³ B29H *5/02*

U.S. Cl. 425—28 R **13 Claims**



1. A take-up apparatus for maintaining tension in an elongated flexible cable member in a space on one side of a wall having an opening for said cable member comprising a supporting member, a support arm mounted on said supporting member, said support arm including a support arm guide for guiding said cable member, a pivot arm mounted on said supporting member for swinging movement between a retracted position adjacent said support arm and an extended position spaced from said support arm, said pivot arm including a pivot arm guide for guiding said cable member, and means for urging said pivot arm away from said retracted position toward said extended position to maintain tension in said cable member.

4,508,498

SPACER DEVICE FOR A TIRE PROCESSING MACHINE

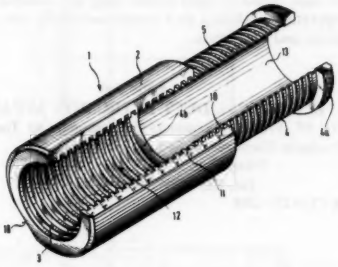
Wilhelm Collmann, Auf der Höhe 25, 2400 Lübeck, Fed. Rep. of Germany

Filed Apr. 2, 1984, Ser. No. 595,911

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 3312618

Int. Cl.³ B29H *5/02*

U.S. Cl. 425—58 **5 Claims**



1. A spacer device for setting the distance between two mutually opposed tire holding means of a tire processing machine, in which at least one of the tire holding means is displaceably mounted for axial displacement into the operating position by means of a connecting rod or of an axial member, the device comprising a spacing element axially screwed into a threaded member, and adapted to act as a stop for establishing the operating position in question, the threaded member and the spacing element being constructed substantially as sleeves, each having a longitudinally extending open ended slot, the slots having widths corresponding at least to the diameter of the connecting rod or axial member, whereby the sleeves may be relatively rotated to place the slots in coincidence to allow lateral mounting of the device on the rod or axial member through the slots.

4,508,499

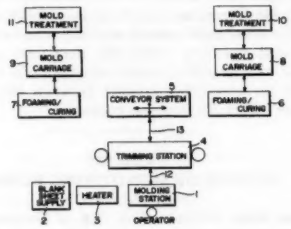
SYSTEM FOR MANUFACTURING THREE-DIMENSIONAL WORK PIECES

Ernst M. Spengler, Heusenstamm by Ffm., Fed. Rep. of Germany, assignor to Stanztechnik GmbH R & S, Frankfurt, Fed. Rep. of Germany

Filed Jun. 8, 1983, Ser. No. 502,284

Int. Cl.³ B26F *1/44*

U.S. Cl. 425—88 **19 Claims**



1. A system for manufacturing three-dimensional work pieces, comprising a number of work stations including tool means operatively carried by said work stations, primary mold means, primary mold support means arranged for cooperation with a work station for carrying said primary mold means, secondary mold means arranged for cooperation with said primary mold means and with said tool means carried by said

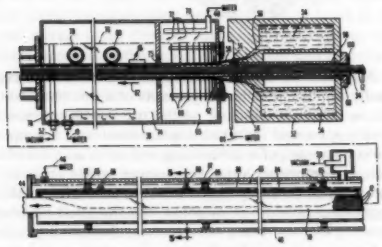
work station, hinging means operatively arranged between said work station and said secondary mold means for engaging said secondary mold means when the secondary mold means are to be tilted from a first position in which said secondary mold means cooperate with said primary mold means into a second position in which said secondary mold means cooperate with said tool means and vice versa, and tilting drive means operatively connectable to said hinging means for tilting said secondary mold means from said first position for cooperating with said primary mold means into said second position for cooperating with said tool means carried by one of said work stations and vice versa.

4,508,500

ELECTRICAL DUCT EXTRUSION APPARATUS

Terry M. French, Cressona, Pa., assignor to Tamaqua Cable Products Corporation, Schuylkill Haven, Pa.

Filed Nov. 3, 1983, Ser. No. 548,503
Int. Cl.³ B29C *17/00*; B29F *3/08*
U.S. Cl. 425—388 **17 Claims**



1. A differential pressure calibrating tank for sizing and cooling just-extruded duct having cable extending therethrough comprising:
- a duct inlet opening to the tank for receiving just-extruded duct from an adjacent extrusion die;
- a calibrator head adjacent the inlet opening for sizing the just-extruded duct;
- a cooling water inlet to the tank, the cooling water partially filling the tank and submersing the just-extruded duct;
- a vacuum source to the tank for creating a differential pressure across the walls of the duct;
- a duct exit from the tank through which sized and cooled duct passes;
- a means for restraining the duct submersed in the water as the duct travels from the duct inlet to the exit; and
- a flexible conduit having one end fixed relative to said extrusion die in a manner such as to permit extrusion of said duct about said conduit and a portion of said flexible conduit extending within the duct inlet opening of the tank, said flexible conduit being movable relative to said tank for precluding contact between the duct and the cable before the duct has cooled.

4,508,501

METHOD OF MONITORING FURNACE INSTALLATIONS

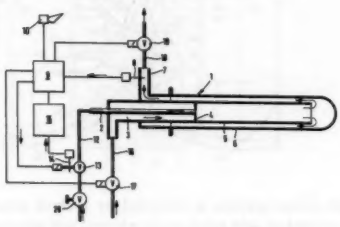
Friedhelm Kühn, Mülheim, Fed. Rep. of Germany, assignor to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Mar. 8, 1983, Ser. No. 473,370
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208765
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—2 **6 Claims**

1. In a burner system containing at least one radiant heating tube to which combustible gas is fed through a gas feed line and combustion air is fed through an air feed line, wherein a safety circuit comprising a gas shut-off means and end position feedback means for confirming the open and closed positions of the gas shut-off means is associated with the gas feed line,

a process for the surveillance of the combustion conditions in the radiant heating tube and for the detection of leakage of the gas shut-off means, said process containing the following steps:

(a) measuring the O_2 partial pressure in the exhaust gas stream at low exhaust gas temperature using a detector which responds to the O_2 partial pressure in the exhaust gas and produces an electrical output signal in accordance with the O_2 partial pressure,



(b) closing the gas shut-off means and confirming the closed position by the end position feedback means,

(c) producing a reference signal in accordance with the process step (b),

(d) comparing the actual level of the detector output signal with a bottom limit value which is derived from the said reference signal, and

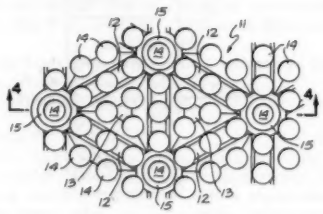
(e) producing an alarm signal if the actual level of the detector output signal is above said bottom limit with the gas shut-off means closed.

4,508,502

INFRARED GAS BURNER PLATE

Jiro Itoh, Nishi-Karasu, Japan, assignor to Rinnai Corporation, Nagoya, Japan

Filed May 6, 1983, Ser. No. 492,323
Claims priority, application Japan, Jun. 14, 1982, 57-88450[U]
Int. Cl.³ F23D *13/12*
U.S. Cl. 431—328 **2 Claims**



1. In an infrared gas burner plate of the type in which a sintered plate body formed of a heat resisting material is provided at its front surface with a plurality of grooves crossing one another to define a plurality of intersecting portions and a plurality of first convex portions, the plate body being additionally provided with a plurality of burner holes therethrough between the front and rear surfaces thereof and distributed over the grooves and the first convex portions, characterized in that each of said intersecting groove portions is provided with a small convex portion having said burner hole at its center, said small convex portions being coplanar with said first convex portions.

4,508,503

INTAKE ASSEMBLY FOR ROTARY DRUMS

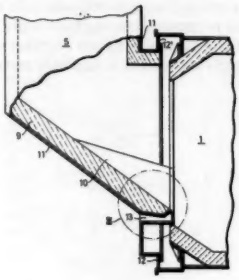
Hubert Ramesohl; Fritz Seelen; Ralf Filges, all of Bergisch Gladbach; Karlheinz Schröder, and Elmar Veiser, both of Cologne, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Oct. 27, 1983, Ser. No. 546,107

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245702

Int. Cl.³ F27B *7/36, 7/02*

U.S. Cl. 432—109 **6 Claims**



1. An intake assembly for introducing materials into a rotary drum which includes:

a housing arranged to discharge into an intake opening of said rotary drum,

a chute forming the discharge end of said housing, said chute including a metal jacket and a refractory lining on said jacket,

said jacket including a double-walled collar composed of individual support segments and restraining said lining from downward sliding movement, said collar having a closed end facing the rotary drum and having at least a partially open end toward the outside of said chute,

webs subdividing said double-walled collar into separate chambers,

holding meand confining said support segments, and

clamping means for securing said holding means to said jacket.

4,508,504

BLAST HEATING APPARATUS FOR BLAST FURNACES

Friedrich Eschmann, Ginsheim-Gustavsburg; Günter Geisdorf, Nordenstadt; Peter Nold, Rümmelsheim; Gotthard Staats, Rehlingen, and Gerhard Subat, St. Augustin, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 492,001

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218126

Int. Cl.³ F27B *14/08*

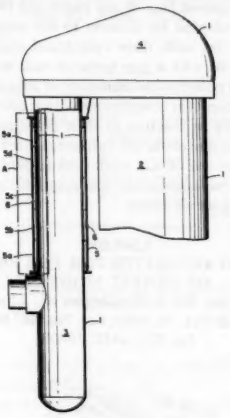
U.S. Cl. 432—217 **10 Claims**

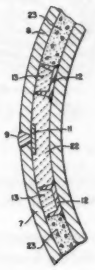
1. In a blast heating apparatus, particularly for blast furnaces, of the type including an inner metal shell having therein a refractory lining, the improvement comprising:

an outer metal shell surrounding at least a portion of said inner metal shell and defining therewith a couble shell structure;

spacers positioned between said outer and inner metal shells and defining therebetween a gap; and

at least a portion of said gap being filled with a pourable dry material having a grain size of up to 8 mm and a heat conductivity of at least approximately 1.5 W/Km, said pourable dry material comprising a dry mass consisting





essentially of 80% by weight of a SiC-graphite mixture, 5% by weight MgO, and 15% by weight $BaSO_4$.

4,508,505

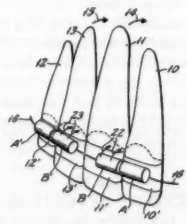
MAGNETIC ORTHODONTIC TORQUING APPLIANCE

Harry Smiley, White Plains, and Abraham Blechman, Tappan, both of N.Y., assignors to Medical Magnetics, Inc., Ramsey, N.J.

Continuation-in-part of Ser. No. 322,423, Nov. 18, 1981, Pat. No. 4,424,030, which is a continuation of Ser. No. 19,427, Mar. 12, 1979, abandoned. This application Nov. 4, 1983, Ser. No. 548,616

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—18 **13 Claims**



1. Orthodontic torquing means, comprising a pair of permanently polarized elongate cylindrical magnet elements, each magnet element being oppositely polarized at the respective

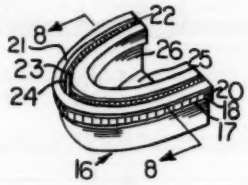
diametral intercepts of a geometric plane which includes the cylindrical axis of the element, whereby a circular end face of the element is characterized by a polarization diameter normal to the cylindrical axis, one magnet element being adapted for fixation to an exposed face of one tooth and the other magnet element being adapted for fixation to the exposed face of an adjacent tooth, (a) with their cylindrical axes in substantial alignment and (b) with a gap between said magnet elements and (c) with the polarization diameters of adjacent end faces of said magnet elements at orientations which differ by at least 45 degrees, whereby in reaction to their polarized orientation a unidirectional torque about the cylindrical axes may be continuously applied to one of said teeth with respect to the other of said teeth, and bio-compatible non-magnetic means encasing each of said magnet elements.

4,508,506

PROCESS AND APPARATUS FOR THE PREPARATION OF DENTAL MODELS

Robert M. Jackson, 308 S. Washington St., Clinton, Ky. 42031

Filed Oct. 31, 1983, Ser. No. 547,090
Int. Cl.³ A61C *19/00*
U.S. Cl. 433—74 **9 Claims**



1. A two-piece device for use in dental reconstruction work in the production of cast dental models from dental stone which comprises:

A. a reusable U-shaped base member including:

1. exterior walls containing accurately-spaced indicia;
2. a top planar surface;
3. a negative cavity in said top planar surface, conforming generally to the shape of a dental arch and having interior walls containing vertically-disposed ridges and grooves;

B. a complementary disposable U-shaped member in the form of a horizontally-disposed plate having exterior side walls and including:

1. a series of cast solid dowel-like members in the form of a simulated dental arch depending from one surface of said plate;
   a. said dowel-like members being formed by alternate vertical ridges and grooves,
   b. said vertical ridges and grooves of said dowel-like members slidably mating with the vertically-disposed ridges and grooves of the negative cavity of said reusable U-shaped base member, and
   c. said horizontally-disposed surface of said plate snugly fitting against the planar surface of said base member;
2. anchoring means on the other surface of said horizontally-disposed plate for positively bonding of said plate with the unset stone of said cast dental model; and
3. accurately-spaced indicia on said side walls, which match the indicia of the side walls of said base member.

4,508,507

MAGNETIC DENTURE RETENTION APPARATUS

Thomas R. Jackson, 146 Renfro St., Mount Airy, N.C. 27030

Filed Oct. 3, 1983, Ser. No. 538,753
Int. Cl.³ A61C *13/22*
U.S. Cl. 433—189 **6 Claims**

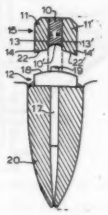
1. A denture comprising:

(a) a base member having at least one artificial tooth mounted therein;

(b) a magnetic assembly embedded in said base member and comprising:

(i) a singular bar magnet having opposed, laterally spaced apart, side pole faces and opposed end surfaces; and

(ii) a pair of magnetic flux transmitting pole members rigidly secured to said magnet on opposite sides thereof and sandwiching said magnet therebetween with said magnet side pole faces in abutting relation to respective conforming surfaces of said pole members so as not to define any space therebetween, said pole members each having end portions extending outwardly from one end surface of said magnet in a form enabling said magnet to be completely embedded in said base member with said



pole member end portions protruding therefrom, said pole member end portions terminating with at least portions thereof formed with surfaces of selected curvature; and

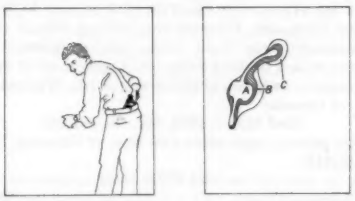
(c) a magnetic flux transmitting keeper element formed in a manner enabling said keeper element to be secured to mouth structure mating said base member when said denture is in place, said keeper element being formed with a selected number of curved surfaces mating said pole member surfaces in a slidable relation and being shaped for operative relation with said pole members such that during occlusion loading of said base member said assembly may rotate at least slightly with respect to said keeper without creating an air gap between the engaging mated curved surfaces of said keeper and pole members.

4,508,508

FIREARM TRAINING SYSTEM

Paris Theodore, 115 E. 62nd St., New York, N.Y. 10021

Filed Sep. 26, 1983, Ser. No. 535,416
Int. Cl.³ F41G *3/26*; F41J *1/00*
U.S. Cl. 434—19 **9 Claims**



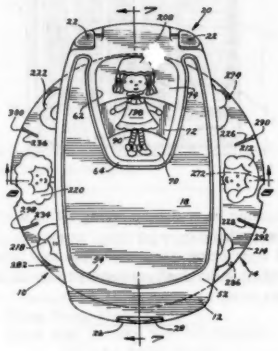
1. A target for firearms training which comprises:

a planar sheet material having on the forward surface indicia that represents a targeted subject and on the reverse surface indicia that corresponds to the human or animal anatomical zone that is coextensive with the area which extends longitudinally from the cranial cavity to the base of the spine and laterally to both sides of the spinal column and to the area surrounding the kidneys of said targeted subject which appears on said forward surface.

4,508,509
DEVICE FOR MAKING PRESELECTED COMPOSITE DESIGNS

Charles A. Cummings, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.

Filed Feb. 4, 1983, Ser. No. 464,083
Int. Cl.[3] B43L *13/00*
U.S. Cl. 434—88 5 Claims

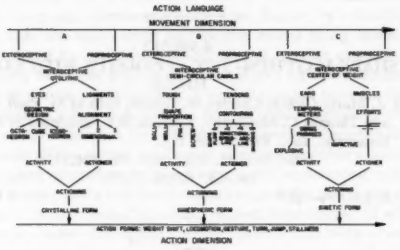


1. A device for making reselected composite designs comprising a tray having a panel therein and a cylindrical post extending upwardly from said panel, an inner ring member having raised design portions on the upper and lower sides thereof and having a central circular opening of a size to fit over said post, an intermediate ring member having a plurality of raised design portions on the upper and lower sides thereof and a central opening of a size to fit over the periphery of said inner ring member, an outer ring member having a plurality of raised design portions on the upper and lower sides thereof and a central opening of a size to fit over the periphery of said intermediate ring member, whereby said ring members can be individually rotated relative to said post to angularly position selected design portions in radial alignment with each other and with said panel so that a composite design can be formed, the design portions on the lower sides of said ring members being angularly displaced with respect to the design portions on the upper sides of said ring members, a cover having an open window therein, said cover being hingedly connected to said tray at one end so that said cover can be lowered onto said tray after said ring members have been relatively rotated to form a preselected design, said window being in alignment with said panel and located so as to provide access to said preselected design, a downwardly projecting detent pin on the lower side of each of said ring members aligned with the particular design portion thereabove, an upwardly projecting detent pin on the upper side of each of said ring members aligned with the particular design portion there below, the angular spacing of said detent pins on the upper sides of said ring members and the angular spacing of said pins on the lower sides of said ring members being greater than the width of said window, and said panel having a detent hole for each ring member for receiving therein any one of said detent pins to maintain said ring members in a fixed relationship after said composite design has been preselected by individually rotating said ring members about said post to angularly position selected design portions in radial alignment with each other, said composite design being formed irrespective of when any one of said ring members is reversed as to its upper and lower sides.

4,508,510
METHOD FOR PSYCHOMOTOR TRAINING OF PHYSICAL SKILLS

Mona Clifford, 2186 A1A 2B, Indian Harbour Beach, Fla. 32937

Filed Dec. 7, 1983, Ser. No. 559,049
Int. Cl.[3] A63B *69/00*
U.S. Cl. 434—247 16 Claims



1. A method of training a person to perform a physical task comprising the steps of:

(a) monitoring the patterning of the person's body parts as the person executes movement;

(b) identifying a prescribed actioning modality with which the person is associated on the basis of the patterning of the person's body parts as monitored in step (a);

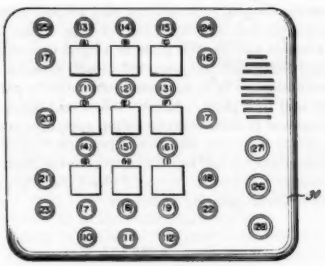
(c) establishing a sequence of action forms to be carried out by said person in the course of performing said task in accordance with the actioning modality of said person as identified in step (b); and

(d) causing the person to perform said task by executing the component movements thereof in accordance with the sequence of action forms established in step (c).

4,508,511
EDUCATIONAL BABY TOY WITH LIGHTS

Wayne F. McQueen, 110 E. Lauderdale St., Tullahoma, Tenn. 37388

Filed May 8, 1984, Ser. No. 608,123
Int. Cl.[3] G09B *5/00*
U.S. Cl. 434—258 10 Claims



1. An elongated baby toy comprising:

a housing;

a plurality of different colored lamps arranged in a pattern of transverse columns and rows mounted on an upper surface of said housing;

a plurality of manually actuable buttons in number greater than the number of said lamps and mounted on said upper surface, each of said lamps being associated with an adjacent button which, when actuated, causes illumination for a fixed time of the adjacent lamp and each of said rows and columns and each of the diagonals of said rows and col-

umns being associated with an adjacent button which, when actuated, causes illumination for a fixed time of each of the lights of that row, column or diagonal sequentially;

means for supplying electrical energy to illuminate said lamps; and

computer means within said housing for controlling illumination of said lamps in response to manual button actuation.

4,508,512

SHAPE-MATCHING TOY APPARATUS WITH SAFETY HINGE

B. J. Maria Girsch; Charles W. Girsch, both of St. Paul, Minn., and Thomas C. McCarthy, Lincoln, R.I., assignors to Hasbro Industries, Inc., Pawtucket, R.I.

Filed Oct. 25, 1982, Ser. No. 436,719

Int. Cl.³ G09B *19/00*

U.S. Cl. 434—259 **7 Claims**

2. A toy apparatus comprising:

a. a first plate having a plurality of apertures of different configurations therein;

b. means for supporting said plate in spaced relation above a supporting surface;

c. a plurality of three-dimensional block elements corresponding in configuration to said apertures and receivable in corresponding apertures;

d. retaining means for resiliently retaining said block elements in their corresponding apertures, so that they project upwardly at least slightly from the upper surface of said plate, said retaining means being resiliently deflectable to allow said block elements to pass through the corresponding apertures upon the application of appropriately directed force to said block elements;

e. a second plate; and

f. means hingedly connecting said second plate to said first plate so that it is movable between a first open position wherein said second plate is hinged upwardly relative to said first plate and a second closed position wherein said second plate is in adjacent, substantially parallel relation to said first plate, whereby when said block elements are disposed in their corresponding apertures and said second plate is moved to said closed position thereof, said second plate engages said block elements to resiliently deflect said retaining means so that said block elements pass through their corresponding apertures.

4,508,513

GAME CARD DEVICE

John Donovan, Hatfield Peverel, England, assignor to Don Marketing Ltd., Essex, England

Filed Dec. 27, 1983, Ser. No. 565,610

Claims priority, application United Kingdom, Jan. 7, 1983, 8300440; Jul. 20, 1983, 8319631

Int. Cl.³ G09B *3/08*

U.S. Cl. 434—346 **11 Claims**

1. A game card device, for participating in a game of skill comprising:

(i) first indicia applied thereto;

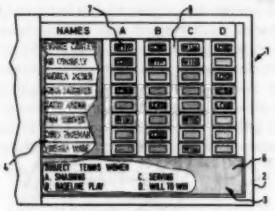
(ii) second indicia applied thereto;

(iii) third indicia applied thereto;

(iv) the first indicia identifying a category or field of activity;

(v) the second indicia identifying a number of different integers associated with the first indicia;

(vi) the third indicia providing a plurality of separate options associated with an association of the first and second indicia;



(vii) an opaque layer camouflaging all of said first, second and third indicia;

(viii) said layer being removable from said first, second and third indicia individually whereby to reveal selected parts thereof.

4,508,514

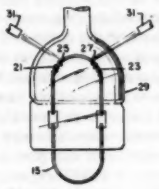
SINGLE-ENDED METAL HALIDE DISCHARGE LAMP ARC GAP FABRICATING PROCESS

George J. English, Reading, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 19, 1983, Ser. No. 533,718

Int. Cl.³ H01J *9/14*

U.S. Cl. 445—26 **19 Claims**



1. A metal halide discharge lamp fabricating process comprising the steps of:

sealing an electrically conductive rod into a quartz envelope;

focusing a laser beam onto said rod to sever said conductive rod and provide an arc gap having a given dimensional length;

filling said quartz envelope with a fill gas; and

sealing said gas filled envelope to provide a metal halide discharge lamp.

4,508,515

BOOK WITH PUPPET

Joel B. Skolnick, 600 5th St., Brooklyn, N.Y. 11215

Filed Oct. 13, 1981, Ser. No. 310,983

Int. Cl.³ A63H *33/38*

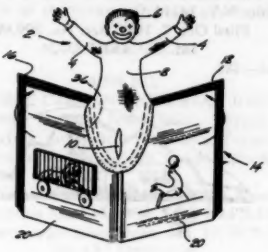
U.S. Cl. 446—148 **2 Claims**

1. In combination:

a hollow puppet having an opening through which a user can introduce a hand to manipulate said puppet within an interior thereof; and

a book having two covers wherein said covers have respective edges which jointly define a central gap bounded by

a peripheral region wherein said puppet is secured to said peripheral region said book having a pluarlity of pages

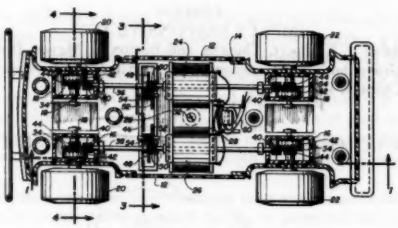


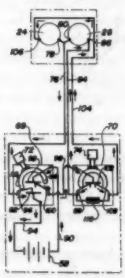
which are all notched to conform with said central gap when said book is opened.

4,508,516
STEERING SYSTEM AND REVERSIBLE DRIVE FOR TOY VEHICLES

Bruce M. D'Andrade, Whitehouse Station, N.J., and Johnny Y. Sing Chuen, Hong Kong, Hong Kong, assignors to Arco Industries Ltd., Hong Kong, Hong Kong

Filed Aug. 3, 1983, Ser. No. 519,819
Int. Cl.³ A63H *29/00*
U.S. Cl. 446—443 **4 Claims**



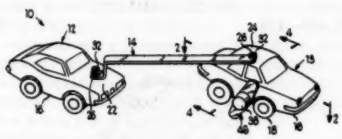


1. A toy vehicle having a chassis supporting a pair of wheels respectively adjacent opposite ends, a pair of electric motors of reversible polarity supported by said chassis, drive means connected respectively between said motors and each wheel of at least one of said pairs of wheels, a portable battery source of electric energy, electric circuit means connecting said source of energy respectively to each of said motors, a first multi-pole direction control switch means in said circuit means having a switch lever movable in opposite directions and operable selectively to deliver electric current to said motors for forward or reverse driving of said vehicle, electric resistance means in said circuit connectable by a second multi-pole speed control switch means having a switch lever movable in opposite directions and selectively operable in said circuit to connect said resistance means in the circuit to one or the other of said motors to drive at least one wheel of said one of said pairs of motors slower than the other and thereby cause said vehicle to turn in one direction or the opposite direction depending upon the reversible setting of said speed control, and said source of electric energy and said first and second switch means being remote from said vehicle and connected thereto by a flexible circuit conduit, said circuit and switch means being further characterized by comprising a first circuit conduit extending commonly from one pole of each motor to a movable contact of said direction control switch, a neutral conduit between the other pole of a first motor and a first movable contact of the speed control switch; a second conduit extending between the other pole of the second motor and a second movable contact of the speed control switch, a third conduit between one pole of said battery and a first fixed contact of said direction control switch, a fourth conduit between a second fixed contact of said direction control switch and the other pole of said battery, and a fifth conduit between a second movable contact of said direction control switch and a fixed contact of said speed control switch, whereby when the motors are in the stop mode, said first and second movable contacts of said direction control switch are in contact with said first fixed contact thereof and the first and second movable contacts of said speed control switch are in contact with the fixed contact of said speed control switch and said electric resistance means being connected between said neutral and second conduits where they are connected to said first and second movable contacts of said speed control switch.

4,508,517
PIVOTABLY LINKED TOY VEHICLES, ONE SELF-PROPELLED

Ralph J. Kulesza, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 1, 1983, Ser. No. 462,753
Int. Cl.³ A63H *29/00*
U.S. Cl. 446—464 **6 Claims**



1. A toy vehicle device comprising:

a pair of vehicles each supported on a surface by spaced apart rotatable wheels, and including a forward hood end, and a generally central roof that is higher than the hood end with respect to the supporting surface;

means including an L-shaped elongated bar connecting one side of the roof of one of the vehicles to generally the center of the front hood of the other of the vehicles for pivotal movement of each of the vehicles relative to the bar about a generally vertical axis while permitting some pivotal movement of the bar about a horizontal axis with respect to each of the vehicles;

means on one of the vehicles for propelling the vehicles over a supporting surface by driving at least one of the wheels of the one vehicle; and

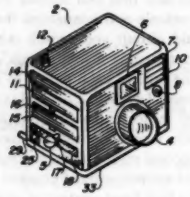
means mounted on said one vehicle for periodically contacting the supporting surface laterally spaced from the one driven wheel for causing the one vehicle to turn about the contact and swing the other vehicle about the one vehicle.

4,508,518

TOY CAMERA THAT PRODUCES SIMULATED PHOTO

Amador G. Exevea, 6609 Thornberry Crescent, Windsor, Ontario, Canada (N8T 3A6)

Filed Dec. 31, 1981, Ser. No. 336,508
Int. Cl.³ A63H *33/30*
U.S. Cl. 446—475 **7 Claims**



1. A toy camera including a simulated camera housing comprising:

a. picture-producing means in said housing including plate means for imparting an impression of a desired form,

b. sheet means within said housing for receiving said impression,

c. ink means within said housing for printing said impression,

d. pressure means mounted in said housing for pressing said plate means and ink means against said sheet means,

e. graspable means connected to said pressure means and extending outside said housing for manual operation of said pressure means, and,

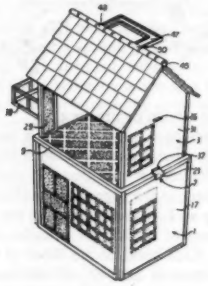
f. said housing including access means whereby said sheet means, after said impression has been received thereon may be removed from within said housing in a manner of a photograph being removed from a real camera.

4,508,519

TOY BUILDING

James R. Becker, 303 E. 57th St., New York, N.Y. 10022

Filed Jan. 4, 1983, Ser. No. 455,469
Claims priority, application United Kingdom, Aug. 1, 1982, 8200482
Int. Cl.³ A63H *3/52*
U.S. Cl. 446—478 **26 Claims**



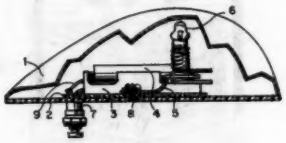
1. A multi-story toy building which is vertically expandable comprising at least first and second parts which are vertically slidably received one within the other, each of said parts comprising at least one story of the building and when extended forms a multi-story building, and catch means for securing the said parts in the extended and collapsed position comprising a lug slidably received on a rail of one of the parts and adapted to be cooperable with an abutment of the other part.

4,508,520

HEART-SHAPED LIGHT-EMITTING NOVELTY

Richard K. Sellers, and Elisabeth A. Sellers, both of 100 Robie St., Buffalo, N.Y. 14214

Filed Oct. 7, 1981, Ser. No. 309,690
Int. Cl.³ A63H *33/26*
U.S. Cl. 446—485 **1 Claim**



1. A heart-shaped light-emitting novelty device comprising:

(a) a heart-shaped hollow housing having a front convex-concave light transmitting cover and a flat rear cover;

(b) an electric circuit housed in said hollow housing and mounted on said rear cover, said electric circuit comprising wire means connecting an electric lamp, a battery, and a switch in a series circuit; said switch being a momentary switch and is mounted on said rear cover through an opening thereon, whereby a portion of said switch is located outside of said housing to allow manual activation of said switch to close said electric circuit to thereby turn-on said electric lamp as long as said switch is manually activated and to turn-off said electric lamp as said manual activation is discontinued.

4,508,521

IMPACT RESPONSIVE TOY

Randall J. Klimpert, Chicago, and Burton C. Meyer, Downers Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 21, 1982, Ser. No. 435,555
Int. Cl.³ A63H *3/12*
U.S. Cl. 446—486 **10 Claims**

1. An impact responsive toy comprising:

an incomplete body member;

a part mounted on the body member;

the part having a periphery divided into a number of sections;

each of the sections having a different appearance;

means mounting the part for movement relative to the body member and to selectively expose to view and accessibility one of the sections to complete the body member while obscuring each section other than the one section;

means moving the part in response to impact upon the part itself to obscure the one section and expose a previously obscured section to change the appearance of the body member without removing the part from the body member;

the part having opposed axle ends and revolving around the axis extending between the axle ends;

the mounting means providing for linear movement of at least one of the axle ends relative to the mounting means in a direction transverse to the axis of revolution in response to impact upon the exposed section;

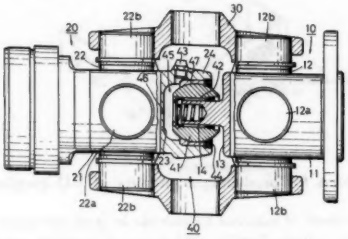
biasing means urging revolution of the part;
releasable latch means restraining revolution of the part; and
impact upon the exposed section moving the part transverse to the axis of revolution effecting release of the latch means.

4,508,522

DOUBLE CARDAN UNIVERSAL JOINT

Akio Numazawa, Nagoya; Ichio Sakai, Toyota; Tadanobu Kumagai, Toyota, and Seiichi Nishikawa, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 109,221, Jan. 3, 1980, abandoned. This application Mar. 30, 1983, Ser. No. 478,815
Claims priority, application Japan, Jan. 10, 1979, 54-1754[U]
Int. Cl.³ F16D *3/26*
U.S. Cl. 464—11 **1 Claim**



1. A valve for a double Cardan universal joint having a pair of spiders connected by a ring-shaped coupling member, a pair of yoke members angularly movably connected with each other by said spiders, a centering assembly for aligning said yoke members with each other and defining a reservoir for grease within a bridge forming a part of one of said yoke members and a breather hole formed in said bridge for allowing said reservoir to communicate with atmosphere, comprising:

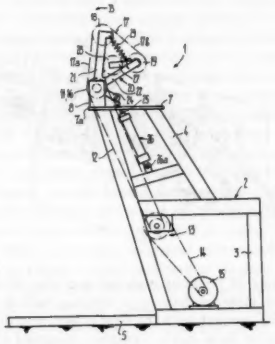
an elastic one-piece valve member disposed in said breather hole, said valve member having a pressured movable portion for elastically blockading said communication of said reservoir with the atmosphere when internal pressure of said reservoir is below a predetermined amount and for being elastically deformed to allow said reservoir to communicate with the atmosphere when said internal pressure reaches or exceeds said predetermined amount wherein said valve member further comprises a stem solid throughout its entire cross-section inserted in said breather hole to define an annular clearance therebetween, a base portion connected to a first end of said stem to closely contact with the inner surface of said bridge and a conical top portions having a semicircularly shaped void in cross section formed therein in communication with said annular clearance, said conical top portion being of a thickness which is smaller than that of said bridge and connected to a second end of said stem to define a ring-shaped clearance between the inner surface thereof and the outer surface of said bridge communicating with said annular clearance, said pressured movable portion forming the outer periphery of said top portion to enclose said ring-shaped clearance and said semicircularly shaped void, wherein said base portion further comprises means for allowing said clearance defined within said breather hole to communicate with said reservoir, and wherein said means for allowing said clearance to communicate with said reservoir further comprises not greater than a first and second slit provided in said base portion from a radially outer surface thereof.

4,508,523

DRIVE MEANS FOR THE SHAFT OF A MOBILE APPARATUS

Willy Leu, Pfäffikon, Switzerland, assignor to Ferag Ag, Hinwil, Switzerland

Filed Apr. 14, 1983, Ser. No. 484,841
Claims priority, application Switzerland, Apr. 20, 1982, 2381/82
Int. Cl.³ F16H *7/14, 7/24*
U.S. Cl. 474—115 **16 Claims**



1. A drive mechanism for driving a shaft of a mobile apparatus, comprising:

a drive unit releasably engageable with the shaft for driving the latter;

said drive unit comprising:

a drive chain having an inner side and an outer side;

three sprocket wheels for guiding said drive chain at said inner side thereof;

one of said three sprocket wheels defining a driven sprocket wheel;

a further sprocket wheel mounted on said shaft to be driven;

said drive chain being engageable on said outer side thereof with said further sprocket wheel in order to extend around part of the circumference thereof and being disengageable therefrom;

tensioning means for maintaining said drive chain in a tensioned state when out of engagement with said further sprocket wheel mounted on said shaft to be driven;

said tensioning means comprising a tension wheel coacting with a return run of said drive chain; and

said tensioning wheel being arranged on said outer side of said drive chain.

4,508,524

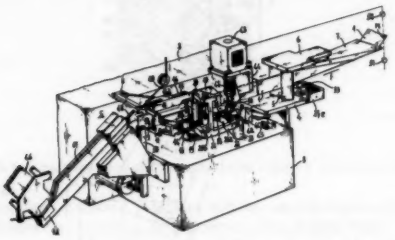
DEVICE FOR CENTERING THE PRINTING OF STRIP MATERIAL FOR THE AUTOMATIC PRODUCTION OF SMALL FILTER BAGS FOR INFUSION PRODUCTS

Andrea Romagnoli, San Lazzaro di Savena, Italy, assignor to IMA - Industria Macchine Automatiche S.p.A., Ozzano Emilia, Italy

Filed Sep. 21, 1982, Ser. No. 420,785
Claims priority, application Italy, Sep. 29, 1981, 3537 A/81
Int. Cl.³ B32B *31/00*
U.S. Cl. 493—11 **3 Claims**

1. Device for centering the printing of strip material, especially in apparatuses for the feeding of such strip in the form of V-shaped labels capable of being associated with a continuous thread for use in machines for the automatic production of small filter bags for infusion products, said strip with printed motifs possessing, between saidprinted motifs, a recurring motif at spacings corresponding to the length of the labels

which are to be produced and said feed apparatus for said strip comprising means for folding the same strip into said upwardly open V-form, means for intermittently feeding said V-folded strip in correspondence with a cutting station for cutting the same strip into single, successive labels and means for reading and/or detecting the position of said recurring motif between the printed motifs of the strip and therefore of the cut labels at a precise position from said cutting station, characterized in that said means for intermittently feeding said V-folded strip in correspondence with said cutting station are constituted of two counterrotating rollers having vertical axes, of which one is a



following roller of resilient material and the other a driving roller of hard material having a driving surface of circular sector form for contact with the first roller, said driving roller of circular sector form being rotatably mounted at the end of one of the arms of a two-armed lever pivoting about a vertical axis, with the other arm of said pivoting two-armed lever encountering, under an elastic action, the free end of a screw-mounted locating element governed by the action of electromagnetic control means subject to the control of the aforementioned means for reading and/or detecting the position of said recurring motifs between the printed motifs of the strip and therefore of said cut labels.

4,508,525

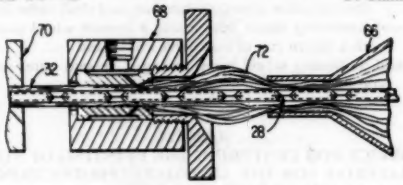
METHOD AND APPARATUS FOR PRODUCING TOBACCO SMOKE FILTER HAVING IMPROVED TAR/CARBON MONOXIDE RATIO

Richard M. Berger, Midlothian, Va., assignor to American Filtrona Corporation, Richmond, Va.

Division of Ser. No. 153,560, May 27, 1980,. This application Jul. 22, 1982, Ser. No. 400,907

Int. Cl.³ B31B *23/01;* B32B *3/00*

U.S. Cl. 493—43 **14 Claims**



1. A method of making smoke filters comprising the steps of:
(a) providing an axially elongated inner member of a material which is impermeable to the passage of smoke;
(b) providing a filtering material including a multiplicity of fibrous elements;
(c) continuously passing said inner member through an elongated bonding zone and defining an annular space around said inner member in said bonding zone;
(d) continuously passing said filtering material into and through said annular space and, intermediate the passage of said filtering material through said bonding zone, contacting same with a bond activating agent to bond said fibrous elements of said filtering material to each other at spaced contact points, thereby forming an elongated, smoke-permeable outer member defining a tortuous path for passage of smoke therethrough; and
(e) transversely severing the resulting product at selected locations to form filter elements.

4,508,526

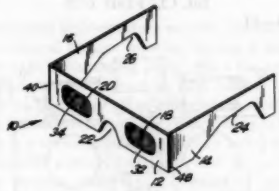
3-D GLASSES AND METHOD FOR PRODUCING SAME

Daniel P. Dutcher, White Bear Lake, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jan. 14, 1983, Ser. No. 458,168

Int. Cl.³ B05B *1/14*

U.S. Cl. 493—346 **9 Claims**



1. A process for producing a plurality of 3-D eyeglasses comprising:
cutting a sheet of material to provide at least one series of eyeglass cutouts therein, said series of eyeglass cutouts comprising a column of first ear cutouts, a column of first eye cutouts, a column of nose cutouts, a column of second eye cutouts and a column of second ear cutouts consecutively arranged in parallel columns, each said eyeglass cutout having opposed top and bottom sides, with said eyeglass cutouts in said series being alternately oriented such that the top side of each said eyeglass cutout is adjacent the top side of one said eyeglass cutout adjacent thereto and such that the bottom side of each said eyeglass cutout is adjacent the bottom side of one said eyeglass cutout adjacent thereto;
adhesively attaching a continuous strip of red film to the column of first eye cutouts and adhesively attaching a continuous strip of blue film to the column of second eye cutouts; and
separating the eyeglass cutouts from one another along lines extending generally perpendicular to said columns and intermediate adjacent eyeglass cutouts in said series.

4,508,527

METHOD AND APPARATUS FOR QUANTITATIVELY DIVIDING ZIGZAG FOLDED SHEET OF PAPER

Tadao Uno, 1-81, Matsugaoka 1-chome, Chigasaki-shi, Kanagawa-ken, and Hiroshi Uno, 3189-7, Samukawa-cho Okada, Kohza-gun, Kanagawa-ken, both of Japan

Filed Sep. 12, 1983, Ser. No. 531,469

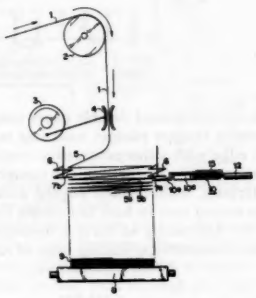
Claims priority, application Japan, Sep. 20, 1982, 57-163694

Int. Cl.³ B65H *45/20, 45/28*

U.S. Cl. 493—357 **3 Claims**

1. A method for quantitatively dividing a zigzag folded sheet of paper, which comprises the steps of:
continuously folding a sheet of paper, which has a plurality of linear perforations bored therein in its width direction and disposed at regular intervals in its lengthwise direction, at positions of said plurality of linear perforations to obtain a zigzag folded sheet of paper having a plurality of divisions connected to one another through said plurality of linear perforations,
continuously accumulating said plurality of divisions one on top of another in the longitudinal direction below a fold processing portion by utilization of their own weights,

inserting a separator carrying a cutting edge protruding beyond said separator and mounted for advancing or retreating movement relative to said separator, when the continuous longitudinal accumulation of said plurality of divisions constitutes a first unit composed of a prescribed number of divisions, between the uppermost division of said first unit drawn out immediately below said fold processing portion and the division directly connected to the uppermost division of said first unit and becoming the lowermost division of a second unit to be subsequently constituted from one end side of the zigzag folded sheet of paper, thereby partitioning said first unit of the zigzag folded sheet of paper,



lowering both said first unit and said separator so as to thereby longitudinally accumulate on said separator the divisions continuously drawn out from said fold processing portion and, at the same time, advancing said separator immediately before a fold between the uppermost division of said first unit and the lowermost division of said second unit, which fold is disposed on the other side of the zigzag folded sheet of paper, and

advancing said cutting edge relative to said separator to cut off said fold from the inside of said fold, whereby units each composed of a prescribed number of divisions are sequentially divided from the zigzag folded sheet of paper during the course of the continuous longitudinal accumulation of said plurality of divisions

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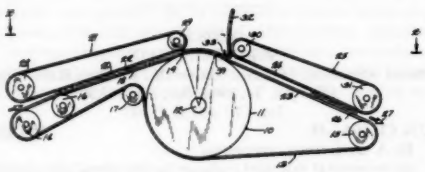
4,508,528

PAD-CROSS FOLDER

John L. Hirsch, and Gene A. VanVoorst, both of Sheboygan Falls, Wis., assignors to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Dec. 29, 1982, Ser. No. 454,406
Int. Cl.³ B31F *1/08, 1/10*
U.S. Cl. 493—426 **4 Claims**



1. Apparatus for cross-folding pads such as diapers, comprising:

a drum for being driven rotationally,

a first conveyor belt having a portion running toward the drum to a first line of tangency therewith and a portion running away from the drum from a second line of tangency therewith, and a portion between said lines of tangency in contact with a segment of the periphery of the drum,

a second conveyor belt running in parallelism with the portion of the first belt running toward the first line of tangency with the drum for engaging an unfolded pad between them and transporting it tangentially to the drum,

a third conveyor belt in parallelism with the portion of the first belt running away from the second line of tangency for engaging a folded pad between them and engaging and transporting it away from the drum,

guide means at each end of the drum and mounted for rotation with the drum and a slide member mounted for sliding on the respective guide means radially of the drum,

means for reciprocating said slide members alternately radially inwardly and outwardly in response to drum rotation,

a lever mounted for pivoting on each said slide member and a finger extending from each lever toward the drum,

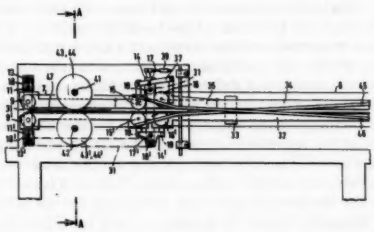
means for guiding said levers and the fingers to pivot axially away from said drum and to move radially outwardly when the slide members are moving radially outwardly of the drum to thereby permit an unfolded pad to pass clear of the fingers for the leading end of the pad to extend tangentially from the drum and for guiding said levers to pivot axially toward the drum and to move radially inwardly when said slide members are moving radially inwardly to thereby cause said fingers to press said pad in opposite directions along its fold line at a time when the trailing end of the pad is still held between the first and second conveyor belts whereupon continued rotation of said drum will cause said pad to fold over, said slide members then moving radially outwardly again to release the fingers from the folded pad after the pad has been engaged for transportation between said third conveyor belt and the portion of the first belt that runs away from said second line of tangency.

4,508,529

APPARATUS FOR FOLDING PAPER SACKS TO Z SHAPE

Richard Feldkämper, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,889
Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216505
Int. Cl.³ B31F *1/00*
U.S. Cl. 493—438 **5 Claims**



1. Apparatus for placing continuously transversely fed flat articles into Z folds, preferably tube sections or cross-bottom sacks of paper, characterised in that, on both sides of the conveying plane of an inlet double belt conveyor consisting of individual double conveyor belts disposed at the respective ends of the articles, co-operating scoring wheels are provided at transverse spacings corresponding to the desired spacings of the folded edges of the Z folds on pairs of shafts parallel to the roller shafts of the inlet double belt conveyor, that one of the individual belts adjoins a double conveyor belt which extends obliquely to the other and which is extended by a straight

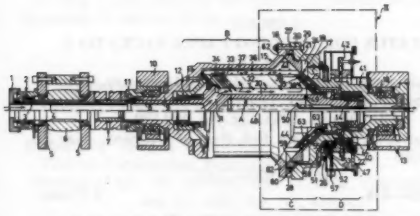
individual double conveyor belt which, in relation to the inlet double belt conveyor, is closer to the other individual double conveyor belt by a distance equal to the shortening of the articles caused by the Z folding, that the end direction-changing rollers of the upper and lower belt of the oblique double conveyor belt with the adjacent direction-changing or drive rollers of the straight conveyor belts can be alternately raised from the direction-changing rollers of the associated double conveyor belt so that each passing article is clamped by only one pair of rollers, and that over substantially the length of the oblique double conveyor belt a folding bar is provided above and another below the conveying planes, which bars extend in the conveying direction from a position beyond the scored zones of the articles, pass through the conveying plane in opposite senses, also intersect in a vertical plane and terminate at a spacing from each other substantially in a horizontal plane.

4,508,530

ENERGY RECUPERATION CENTRIFUGE

Raymond F. Schlegel, Colombes; René P. Bourassin, Neauphle-le-Chateau, and Michel A. Lapautre, Ville D'Avray, all of France, assignors to Bertin & Cie, Plaisir, France

Filed Aug. 17, 1983, Ser. No. 523,949
Claims priority, application France, Aug. 27, 1982, 82 14702
Int. Cl.³ B04B *1/00*
U.S. Cl. 494—49 **14 Claims**



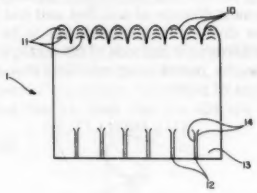
1. High-output industrial centrifuge with improved energy efficiency, for purifying a liquid containing denser solid particles in suspension and/or droplets of a less dense fluid in emulsion, of the type comprising a rotor essentially comprising a stack of centrifuging dishes rotating at high speed between two coaxial cylindrical drums, means for continuously introducing and discharging the liquid, and means for the selective extraction of the separated impurities, characterized in that in the space between an outer cylindrical drum (B) and an inner drum (A), which drums are independently driven in coaxial rotation and are respectively provided with means for the discharge of the separated phases, is disposed a stack of dishes **(33)** which rotates with the inner drum and which is fed with liquid to be purified through an axial inlet followed by a centrifugal wheel; in that the purified liquid passes out of the said space through an oulet wheel composed of blade **(39)** fastened to the inner drum (A) and forming a centripetal turbine, and then through tangential ejectors **(40)** fastened to the outer drum, (B), and in that a reaction turnstile is formed arranged in such a manner that the absolute exit speed of the purified liquid will be substantially zero, so that the said turbine and the said turnstile restore in the form of driving torque the major part of the kinetic moment imparted to the liquid, and that in consequence the driving power required under continuous operating conditions is limited to compensation for frictional losses.

4,508,531

CONVOLUTELY WOUND PAPER TAMPON TUBE

Howard A. Whitehead, Outagamie County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 6, 1982, Ser. No. 446,838
Int. Cl.³ A61F *15/00*
U.S. Cl. 604—14 **1 Claim**



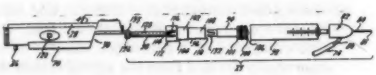
1. Convolutely wound flexible paper tampon tube designed to surround a tampon pledget with said tube having a hemispherical edge with a thermosensitive coating, a gripping end and insertion end; said insertion end comprising a plurality of nonoverlapping, multi-layered aligned arcuate lobes, each of said lobes scored near its base to increase flexibility, said lobes collectively deformable to form a hemispherical profile and cover said hemispherical leading edge of said tampon.

4,508,532

OPHTHALMIC ASPIRATOR/IRRIGATOR AND CYSTOTOME

Robert C. Drews; Danny D. Meyer; Tadmor Shalon, and Eliezer Pasternak, all of St. Louis, Mo., assignors to Ninetronix, Inc., St. Louis, Mo.

Filed Sep. 9, 1983, Ser. No. 530,730
Int. Cl.³ A61B *17/32*
U.S. Cl. 604—22 **16 Claims**



1. An ophthalmic irrigator-aspirator comprising; a handpiece, a bidirectional motor means disposed within said handpiece, a drive shaft coupled to said motor means, syringe means having a tube and an opening in one end thereof, a piston internally disposed within said tube, said piston having means cooperating with said drive shaft such that said piston is translatable within said tube in a direction causing aspiration through said tube opening as said motor means is rotated in one direction, and causing irrigation through said tube opening when said motor means is rotated in an opposite direction, and manually actuable means on said handpiece for causing rotation of said motor means in either rotational direction.

4,508,533

SURGICAL DRAIN

Daniel Abramson, 7671 San Mateo Dr., E., Boca Raton, Fla.

Filed Jul. 14, 1980, Ser. No. 167,905
Int. Cl.³ A61M *27/00*
U.S. Cl. 604—35 **20 Claims**

20. A sump drain comprising:

(a) an integral extruded catheter having distal and proximal ends and comprising:

(i) a first lumen for the drainage of body fluids by suction;

(ii) a second lumen for the passage of filtered air;

(iii) a third lumen for the passage of irrigation fluid, said first, second and third lumens extending parallel to each other along the major portion of the longitudinal length of the catheter;

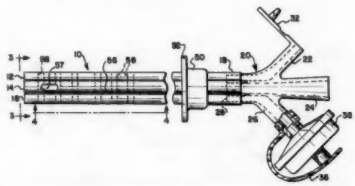
(iv) a funnel portion at its proximal end, said funnel por-

tion having a connector receiving port extending from the first lumen, a filtered air intake port extending from the second lumen, and an irrigation port extending from the third lumen;

(v) holes at its distal end, said holes connecting each of the first, second, and third lumens to the exterior of the catheter;

(b) means for closing the irrigation port;

(c) a connector, said connector being arranged and constructed so that fluid may pass from the first lumen



through the connector, said connector having a proximal end including a suction port;

(d) means for closing the suction port of the connector;

(e) a bacteria filter, said bacteria filter having means for filtering bacteria from air and being arranged and constructed so that air may pass through the bacteria filter and into the second lumen, said bacteria filter having a bacteria filter air intake port for the intake of air;

(f) means for closing the bacteria filter air intake port; and

(g) a collar slidably disposed about the catheter.

4,508,534

ASSEMBLY EMPLOYING A BREAKABLE THERMAL BOND WHICH IS NOT SUBSTANTIALLY EFFECTED BY PROLONGED HEAT EXPOSURE

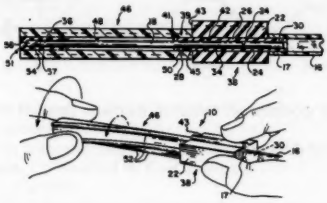
Edward B. Garver, Sr., Lindenhurst, and Kenneth D. Zabielski, McHenry, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 326,737, Dec. 2, 1981, Pat. No. 4,402,682. This application May 16, 1983, Ser. No. 495,281

Int. Cl.[3] **A61M** *5/32*

U.S. Cl. 604—111 **1 Claim**

1. An assembly comprising two members which are releasably secured together by a thermal bond which is selectively breakable in response to the application of a force which does not cause permanent deformation of either member, regardless or prolonged exposure of said assembly to heat, the composition of one of said members comprising an autoclavable polyester material, and the composition of the other one of said members consisting essentially of between approximately 72% and 77% by weight of a vinyl material, approximately 3% by



weight of a silicone material, and the remainder comprising calcium carbonate.

4,508,535

CANNULA

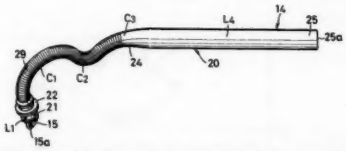
Yasushi Joh; Noriaki Kaneko, both of Yokohama, and Toshio Nagase, Houjoshinmachi, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1983, Ser. No. 483,138

Claims priority, application Japan, Apr. 10, 1982, 57-59913; Apr. 10, 1982, 57-59918

Int. Cl.[3] **A61M** *25/00*

U.S. Cl. 604—282 **20 Claims**



1. A tubular cannula for use as connected to an artificial heart compensating for partial or entire functioning of a heart function, wherein an axis of a tubular portion of said cannula has a three-dimensional configuration by being bent at least twice in different directions between an insertion distal end tip for insertion into a heart and a connection proximal end tip for connection with the artificial heart, said tubular portion comprising a first bent portion of an arcuated shape, located in the vicinity of said insertion distal end tip; a second bent portion of an arcuated shape located between said first bent portion and said connection proximal end tip; and a third bent portion of an arcuate shape, located between said first bent portion and said second bent portion; wherein an angle is formed by a first imaginary plane including an axis of said first bent portion and a second imaginary plane including an axis of said second bent portion, said angle being within a range of 5° to 85° and preferably within a range of 10° to 45°, and wherein, said third and second bent portions form an overall S-shape, and said first and third bent portions form an overall inverted S-shape, such that the combination of said first through third bent portions forms a meandering configuration.

4,508,536

SOLID DYE MIXTURES FOR DYEING POLYACRYLONITRILE NAVY BLUE TO BLACK

Paul Erzinger, Liestal, and Arnulf R. Läpple, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

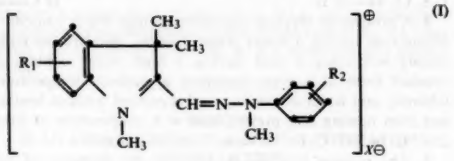
Filed Nov. 14, 1983, Ser. No. 551,393

Claims priority, application Switzerland, Nov. 16, 1982, 6668/82

Int. Cl.[3] **D06P** *67/02;* **C09B** *26/04*

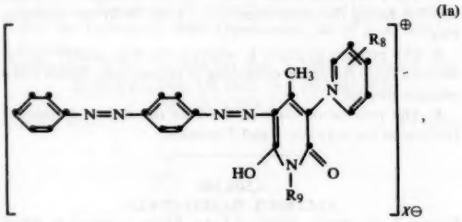
U.S. Cl. 8—639 **10 Claims**

1. A solid, navy blue to black preparation consisting essentially of a cationic yellow component of the formula



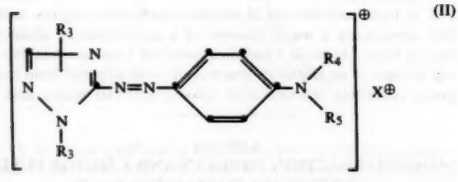
(I)

or



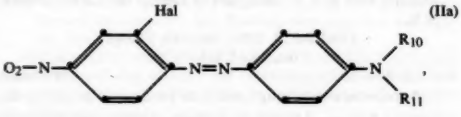
(Ia)

a cationic red component of the formula



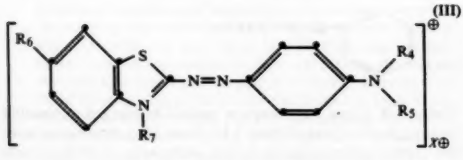
(II)

or



(IIa)

and a cationic blue component of the formula



(III)

or

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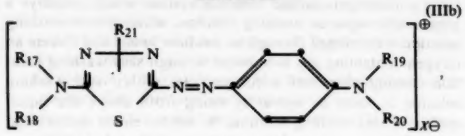


(IIIb)

or mixtures thereof, in which formulae the symbols have the following meanings;

R_1 and R_2 independently of one another are each hydrogen, halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,

R_3 is C_1–C_4-alkyl,

R_4 and R_5 independently of one another are each unsubstituted or substituted C_1–C_4-alkyl,

R_6 is C_1–C_4-alkoxy or acylamino,

R_7 is C_1–C_4-alkyl,

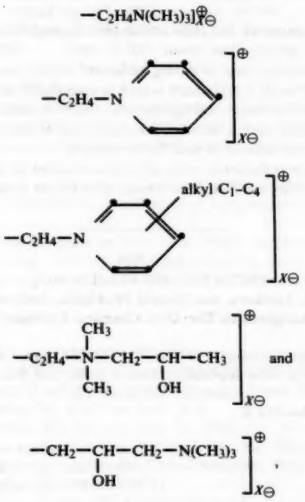
R_8 is hydrogen or methyl,

R_9 is hydrogen or unsubstituted or substituted C_1–C_6-alkyl, or is phenyl or cyclohexyl,

Hal is chlorine or bromine,

R_{10} is C_1–C_4-alkyl,

R_{11} is a radical of any one of the formulae



and

R_{17}, R_{18}, R_{19} and R_{20} independently of one another are each unsubstituted or substituted C_1–C_6-alkyl, or R_{17} forms with R_{18}, with the inclusion of the N atom and optionally further hetero atoms, a heterocyclic 5- or 6-membered ring,

R_{21} is unsubstituted or substituted C_1–C_3-alkyl, and

X is an anionic radical, and optionally further additives.

4,508,537

METHOD FOR REMOVING ELEMENTAL SULFUR PARTICLES FROM THE AQUEOUS WASHING SOLUTION OF A HYDROGEN SULFIDE REMOVAL PROCESS

Donald M. Fenton, Anaheim; Dennis D. Delaney, Placentia, and F. Emmett Bingham, Mission Viejo, all of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Dec. 27, 1982, Ser. No. 453,501

Int. Cl.[3] **C01B** *17/04*

U.S. Cl. 23—293 S **26 Claims**

1. In a method for removing particles of elemental sulfur

from a hydrogen sulfide removal system which employs a regenerable aqueous washing solution, wherein said washing solution is circulated through an oxidizer vessel and therein an oxygen-containing gas is bubbled through said washing solution causing elemental sulfur particles within said washing solution to form an upwardly rising froth above the liquid surface of said washing solution, the improvement comprising:

(a) admixing said washing solution within said oxidizer vessel with a hydrocarbon consisting essentially of carbon and hydrogen atoms, having a distillation curve with a 90 percent point less than about 680° F. and having a flash point greater than about 100° F.; and

(b) admixing said washing solution within said oxidizer vessel with a surfactant which is essentially nonionic and has a first functional component which is partially soluble in water and a second functional component which is partially soluble in said hydrocarbon;

wherein the volumetric ratio of said surfactant to said hydrocarbon within said oxidizer vessel is between about 7:1 and about 1:7.

4,508,538

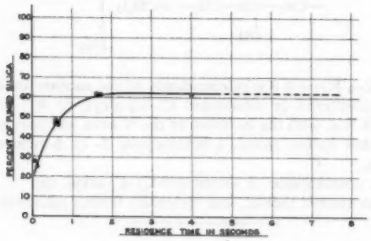
RECOVERY OF FUMED SiO_2

Joel F. M. Leathers, and Donald W. Calvin, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 761,558, Jan. 24, 1977, abandoned. This application Dec. 4, 1980, Ser. No. 212,762

Int. Cl.³ C01B *33/12*

U.S. Cl. 23—313 R **10 Claims**



1. A method for collecting fumed hydrophobic silica formed in a combustion chamber by the flame hydrolysis of a ternary azeotrope comprising about 36% H_2SiF_6, about 10% HF and about 54% H_2O in which the hot product stream leaving the combustion chamber carries the fumed hydrophobic silica as an ultra-fine dispersoid at a concentration of less than about 1.5% by weight, the said method comprising,

passing the hot product stream immediately after it leaves the combustion chamber through a non-classifying agglomerator for a travel time in the agglomerator of from about 1.5 to about 4.0 seconds during which travel time the temperature of the product stream drops to not less than about 150° C., and

collecting the agglomerated, fumed, hydrophobic silica in a dispersoid-collecting device while allowing the remainder of the product stream to flow through.

4,508,539

PROCESS FOR IMPROVING LOW QUALITY COAL

Masayuki Nakai, Sodegaura, Japan, assignor to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Feb. 16, 1983, Ser. No. 466,835

Claims priority, application Japan, Mar. 4, 1982, 57-32983

Int. Cl.³ C10L *5/08*

U.S. Cl. 44—10 D **15 Claims**

1. A process for treating coal having a high water content to obtain coal having a lower water content, said process comprising subjecting a coal having a high water content in crushed form to a press treatment at ambient temperature whereby said water-containing coal is pressed without heating and then heating said pressed coal at a temperature of from 250°° C. to 500° C. for between 1 and 10 minutes.

2. The process of claim 1, wherein the diameter of the crushed coal is up to 50 millimeters.

3. The process of claim 1, wherein the amount of pressure applied during the press treatment is from 30 to 200 megapascals.

4. The process of claim 1, wherein the low quality coal is selected from the group consisting of brown coal, lignite and a mixture thereof.

5. The process of claim 1, wherein the step of heating is performed for between 1 and 5 minutes.

4,508,540

ALCOHOL BASED FUELS

Warren L. Perilstein, Orchard Lake, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 2, 1981, Ser. No. 317,567

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—53 **13 Claims**

1. A liquid fuel for use in internal combustion engines, said fuel comprising a major amount of a monohydroxy alkanol having from 1 to about 5 carbon atoms, and a corrosion inhibiting amount of an aliphatic dicarboxylic acid selected from the group consisting of oxalic acid, sebacic acid and azelaic acid.

4,508,541

MANNICH REACTION PRODUCT AND A MOTOR FUEL COMPOSITION CONTAINING SAME

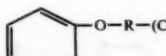
Benjamin J. Kaufman, Wappingers Falls, and Rodney L. Sung, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 5, 1983, Ser. No. 510,487

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—71 **20 Claims**

1. A material comprising a reaction product of an aldehyde, a phenoxy acid and a mono- or diamine, wherein said aldehyde comprises a hydrocarbon radical having from 1 to about 10 carbon atoms, said phenoxy acid has the following formula:



wherein R is any hydrocarbon radical or oxygen-containing hydrocarbon radical of from 1 to about 36 carbon atoms with the carbon atom adjacent to the carboxylic acid functional group having at least one active hydrogen atom, and x varies from 1 to 3, said monoamine has the formula:

$$X-N-X^1$$
$$\quad\;\; X^2$$

wherein X, X^1, and X^2 can be any hydrocarbon radical having from about 6 to about 36 carbon atoms and wherein X^1 and X^2 can be a hydrogen atom, said diamine has the following formula:

$$NH_2-(C_zH_{2z})N-R^1$$
$$\quad\;\; R^2$$

wherein z varies from about 1 to 3, R^1 is any hydrocarbon radical or oxygen substituted hydrocarbon radical having from about 1 to 36 carbon atoms and R^2 is a hydrogen or a methyl group.

4,508,542

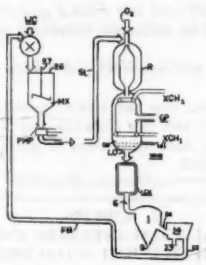
SLAG SEPARATOR FOR A COAL GASIFICATION INSTALLATION

Joseph Langhoff, Kleinbergerhof 10, 4220 Dinslaken; Erwin Althoff, An der Dorndelle 7, 4619 Bergkamen; Wolfgang Kolodzey, Koloniestr. 57, 4100 Duisburg, and Ulrich Gerhardus, Im Terfreen 4, 4200 Oberhausen, all of Fed. Rep. of Germany

Continuation of Ser. No. 230,741, Feb. 2, 1981, abandoned. This application Dec. 16, 1983, Ser. No. 562,042

Int. Cl.³ C10J *3/52*

U.S. Cl. 48—77 **3 Claims**



1. In a coal gasification installation having a gasifier reactor and a water bath below the reactor for collecting slag from the reactor wherein a mixture of water and slag particles is derived from said water bath,

a slag separator connected for sorting said water and slag mixture into heavier, non-floating, slag particles and lighter, floating slag particles,

said separator comprising a container to be filled with said water and slag mixture for receiving under pressure said water and slag mixture from an upper inlet, said container having:

at least one water discharging side outlet,

a lighter slag particle discharging side outlet, and

a heavier slag particle discharging lower end outlet,

partition means disposed in said container and extending in operation in water and separating said at least one water discharging side outlet and said floating particle discharging side outlet for separating said floating slag particles from the water, substantially clean water being discharged through said water discharging side outlet, wherein separated floating slag particles are discharged at least in part through said lighter slag particle discharging side outlet,

said partition means forming a compartment in said container for accumulating said floating particles,

said partition means including a dam, said partition means being disposed to allow said substantially clean water, during operation, to flow over said dam of said partition means and out through said at least one water discharging side outlet, and also to retain said lighter floating slag particles within said compartment,

said upper inlet being disposed to admit said slag and water mixture flow into said water from above,

at least a conduit connecting said upper inlet to said water bath,

said inlet connected to a tube extending into said container,

a wall being disposed in said tube for guiding said heavier slag particles downwardly toward said heavier slag particle discharging lower end outlet and also for guiding said lighter, floating, slag particles underneath said wall into said compartment for accumulating said floating particles for discharge through said lighter slag particle discharging side outlet, and

feedback means for feeding back said lighter slag particles into said gasifier reactor.

4,508,543

PROCESS FOR THE CATALYTIC GASIFICATION OF SOLID FLUIDS WITH STEAM

Siegfried Peter, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 13, 1979, Ser. No. 29,719

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1978, 2817835

Int. Cl.³ C10J *3/00*

U.S. Cl. 48—197 R **11 Claims**

1. In a process of a catalytic gasification of solid carbon fuels with steam employing steam volatile catalysts at high temperature and pressure, the improvement which comprises the steps of:

1. forming a supersaturated solution of the catalyst in steam under supercritical conditions of temperature and pressure;

2. reducing the pressure to a value below supercritical; and

3. contacting resulting catalyst containing steam with the carbon fuel to be gasified thereby accelerating the reaction between the coal and steam.

4,508,544

CONVERTING A FUEL TO COMBUSTIBLE GAS

Gerald Moss, Wantage, England, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 360,411, Mar. 22, 1982, Pat. No. 4,459,133. This application Dec. 12, 1983, Ser. No. 560,241

Claims priority, application United Kingdom, Mar. 24, 1981, 8109230; Mar. 24, 1981, 8109231

Int. Cl.³ C10J *3/00, 3/54*

U.S. Cl. 48—197 R **8 Claims**

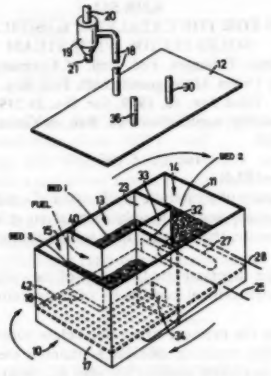
1. A process using an apparatus comprising a unitary vessel comprising a substantially vertical peripheral wall and a roof. the interior of the vessel being divided into at least three horizontally-successive compartments by substantially vertical internal walls extending downwardly from the roof, each compartment having a respective distributor at its base which distributes a respective fluidizing gas from a respective space beneath the distributor into the bottom of each compartment and into a bed of solid particles supported on the top of the respective distributor thereby maintaining said particles in a respective dense phase fluidized bed, each dense phase fluidized bed having a substantially distinct top surface at a respective top level within the respective compartment, the roof over each compartment having a respective outlet for the exit of gas from the compartment, each compartment having an internal wall defining an underflow weir below the said top level and thereby providing communication between a lower region of the downstream end of one compartment on one side of the internal wall and a lower region of the upstream end of an adjacent compartment on the other side of the wall, and in which process, particles circulate from the lower region of the

downstream end of the fluidized bed in one compartment to the lower region of the upstream end of the adjacent fluidized bed in the adjacent compartment, and wherein said process comprises:

a. passing a gas substantially free of diluents and which contains an oxygen-transfer mediator into a first compartment containing a first dense phase fluidized bed containing particles comprising chemically reactive $CaSO_4$ at a temperature in the range of from 850° to 1150° C.;

b. passing an oxygen-containing gas into the second compartment containing a second dense phase fluidized bed of particles of chemically reactive CaS at such a rate as to convert some, but not all, of the CaS in the second dense phase fluidized bed to $CaSO_4$ with substantially no liberation of the sulfur moiety therefrom and such that the gas leaving the second compartment via the respective outlet in the roof contains substantially no sulfur moiety and no more than 5 vol% of molecular oxygen;

c. passing an oxygen-containing gas into the third compart-



ment containing a third dense phase fluidized bed of particles comprising chemically reactive CaS at a temperature higher than the temperature in the first bed at such a rate that substantially all chemically-reactive CaS is exothermically converted to $CaSO_4$ with substantially no liberation of sulfur moiety and the gas leaving the third compartment via the respective outlet in the roof is substantially free of sulfur moiety and contains no more than 5 vol% of molecular oxygen, and wherein particles circulate through all the compartments of the apparatus in one sense from the bottom region of one bed in one compartment to the bottom region of the adjacent bed in the adjacent compartment so that particles circulate through all the beds in succession, and wherein a hydrocarbon and/or carbonaceous fuel is passed into the first compartment in contact with the particles of the first dense phase bed to convert the fuel to combustible gas and to reduce chemically reactive $CaSO_4$ to CaS with substantially no liberation of sulfur moiety as a result of the presence of the oxygen-transfer mediator.

4,508,545

CLOSED LOOP WATER TREATING SYSTEM AND METHOD

Walter W. DeLoach, 818 Cattlemen Rd., Sarasota, Fla. 33582

Continuation-in-part of Ser. No. 533,216, Sep. 19, 1983,. This application Nov. 7, 1983, Ser. No. 549,139

Int. Cl.[3] **B01D** *19/00*

U.S. Cl. 55—53 **20 Claims**

19. The method for treating water comprising the steps of:

(a) flowing water into a first chamber through spray heads in a conduit therein;

(b) flowing said water over a plurality of slat trays or plastic packing media disposed beneath said conduit;

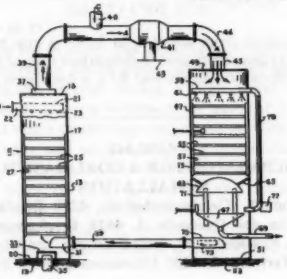
(c) releasing entrained gases from said water and creating thereby product water;

(d) flowing said product water into the bottom of said first chamber;

(e) creating in the bottom of said first chamber means for preventing said released gases from flowing through said means with said product water;

(f) flowing said product water from said first chamber;

(g) flowing said released gases from said first chamber through a demister into a second chamber;



(h) flowing said released gases downwardly in said second chamber and contacting said released gases with an iron salt solution in said second chamber;

(i) flowing said iron salt treated gases over slat trays or plastic packing media and forming a sludge that precipitates;

(j) collecting and removing said sludge from said second chamber;

(k) flowing said iron salt treated gases from said second chamber into said first chamber; and

(l) introducing make-up ambient air into said second chamber as required.

4,508,546

MECHANICAL FOAM BREAKERS AND A PROCESS FOR MECHANICAL FOAM-BREAKING

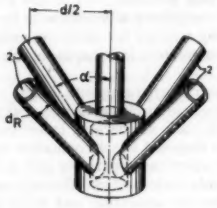
Marko Zlokarnik, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 236,485

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1980, 3008589

Int. Cl.[3] **B01D** *19/02*

U.S. Cl. 55—87 **6 Claims**



1. A process for mechanical foam breaking, comprising: drawing foam into a rotating suction tube of which at least 3 channels branch radially upwardly and outwardly at an angle α of approx. 30° to approx. 60°, and throwing the foam outwardly through these channels at a cover disposed immediately thereabove.

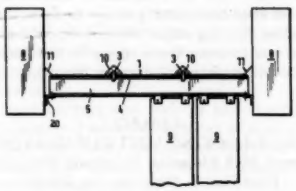
6. A mechanical foam breaker comprising:
a housing including a cover;
a vertical tube within the housing having a lower end receptive of foam to be broken and an upper end connected to a source of suction;
a plurality of channels extending radially upwardly and outwardly from the suction tube at an acute angle to the longitudinal axis of the suction tube and opening towards said cover at an obtuse angle and immediately beneath same;
means for rotating the suction tube and channels about the longitudinal axis of the suction tube at a sufficient speed to compress foam drawn up through the suction tube and into the channels and to throw the compressed foam at the cover.

4,508,547

ELECTROSTATIC PRECIPITATOR HAVING A SEALING COVER OR ROOF

Josef J. Seufert, Rüsselsheim, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 2, 1983, Ser. No. 500,295
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3221718
Int. Cl.³ B03C *3/82*
U.S. Cl. 55—101 **3 Claims**



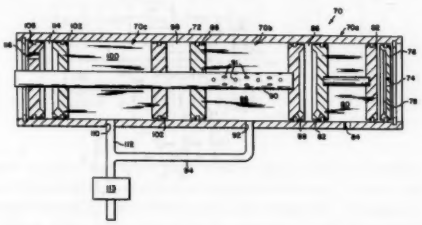
1. In an electrostatic precipitator, a sealing cover assembly which comprises:
a plurality of transversely spaced mutually parallel beams extending in a gas flow direction of said precipitator and formed with upper flanges;
a plurality of sheet metal cover sheets overlying said beams and having interstices between juxtaposed edges of successive sheets extending transverse to said direction;
a multiplicity of clips for securing said sheets to said flanges, each of said clips engaging over an edge of a respective flange and having a head overlying and clamping juxtaposed edges of a respective pair of sheets against the respective flange; and
strips welded to said sheets and sealing said interstices, each of said clips comprising a "C" shaped body having an upper arm formed as said head and a lower arm engaged beneath the respective flange, said body being spread slightly upon application of said flange and the respective sheets whereby said sheets are retained against said flanges by the intrinsic resiliency of said clips, each of said heads being formed by a bar welded to an upper arm of the respective body and overlying juxtaposed edges of a pair of respective sheets.

4,508,548

AIR OXYGEN AND NITROGEN CONCENTRATION DEVICE

Scott A. Manatt, Granada Hills, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 4, 1981, Ser. No. 289,861
Int. Cl.³ B01D *53/22*
U.S. Cl. 55—158 **2 Claims**



1. A system for producing oxygen enriched gas and oxygen depleted gas, said system comprising:
a source of pressurized air;
a tubular housing having an opening at one end to receive pressurized air from said source;
a first plurality of hollow fibers disposed in said housing and having a fixed short length to receive pressurized air from the opening at one end of said housing to produce a high pressure rapid flow of air therethrough for a high rate of oxygen permeation thereacross without significant permeation of nitrogen, said tubular housing including an opening therein to remove the permeated oxygen enriched gas from said housing;
a second plurality of hollow fibers disposed in said housing downstream of said first plurality of hollow fibers to receive oxygen depleted pressurized air therefrom and permeate oxygen therethrough, said second plurality of hollow fibers having a fixed length substantially greater than the fixed short length of said first plurality of hollow fibers to expose the oxygen depleted pressurized air to permeation in the hollow fibers for a greater period of time; and
a perforated tube disposed amongst the second plurality of hollow fibers to wash the hollow fibers with ambient air to remove oxygen permeated therethrough and reduce the pressure at the exterior of the hollow fibers to enhance permeation therethrough, said tubular housing including openings to remove the mixture of permeated oxygen enriched gas and air from the perforated tube from said housing and to remove the oxygen depleted gas from the second plurality of hollow fibers.

4,508,549

PRESSURE REDUCTION APPARATUS FOR SOLID PARTICLE-CONTAINING HIGH PRESSURE LIQUIDS

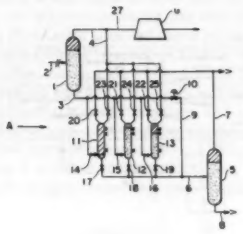
Kohichi Beppu, Nishinomiya, and Shigezo Kawakami, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 22, 1983, Ser. No. 516,283
Claims priority, application Japan, Jul. 24, 1982, 57-129164; Mar. 7, 1983, 57-37170; May 25, 1983, 58-93245
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—165 **14 Claims**

1. A pressure reduction apparatus for solid particle-containing high pressure liquids comprising:
a gas and liquid pressure reduction tower having a gas phase zone and a liquid phase zone;
a high pressure gas and liquid separation tower having a gas phase zone connected to the gas phase zone of said gas and liquid pressure reduction tower through a first line provided with a high pressure gas charge or discharge valve,

and a liquid phase zone connected to the liquid phase zone of said gas and liquid pressure reduction tower through a second line having a feed valve for liquid being reduced; and

a lower pressure gas and liquid separation tower having a gas phase zone connected to the gas phase zone of said gas and liquid pressure reduction tower through a third line having a low pressure gas charge or discharge valve, and



a liquid phase zone connected to the liquid phase zone of said gas and liquid pressure reduction tower through a fourth line having a valve through which a pressure reduced liquid is discharged, wherein prior to opening of the feed valve or the pressure-reduced liquid discharge valve, the higher pressure gas charge or discharge valve, or the lower pressure gas charge or discharge valve is opened so as to increase or decrease a pressure within a corresponding gas and liquid separation tower.

4,508,550

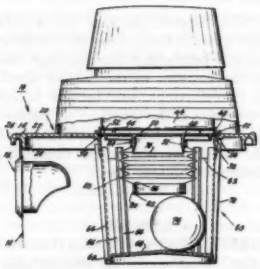
AIR FLOW RESPONSIVE OUTLET FROM TANK OF VACUUM CLEANER

Robert C. Berfield, Jersey Shore; Robert L. Crevling, Jr., Williamsport, and Lonnie B. Lawson, Jr., Linden, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Filed Apr. 28, 1983, Ser. No. 489,369

Int. Cl.³ B01D *46/00*

U.S. Cl. 55—216 **14 Claims**



1. A vacuum cleaner with an air flow responsive air exit, comprising:

a collecting tank for collecting suctioned material; an inlet to the tank for air, liquid and particulate material; an air exit from the tank; suction means communicating with the air exit for drawing air out of the tank through the air exit and for thereby creating suction at the air inlet;

a floatable element capable of floating on liquid, and a guide supporting the floatable element beneath the air exit for guiding and enabling the element to float up toward the air exit as the level of liquid in the tank rises and the liquid floats the element up toward the air exit;

means attached to the air exit including means selectively movable downwardly into the tank and toward the floatable element and upwardly in the tank and away from the floatable element; that means including the entrance port into the air exit; that means being movable responsive to the velocity and amount of air flow through the air exit caused by the suction means, such that the means moves downwardly on reduced air velocity or reduced air flow and upwardly on increased air velocity or increased air flow.

4,508,551

STEAM DISTRIBUTOR

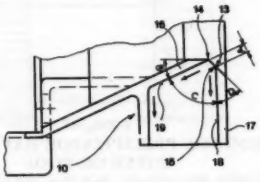
Erwin Ruoss, Münchenstein, and Kurt Sieber, Ettingen, both of Switzerland, assignors to Condair AG, Munchenstein, Switzerland

Filed Oct. 17, 1983, Ser. No. 542,365

Claims priority, application Switzerland, Oct. 25, 1982, 6212/82

Int. Cl.³ F24F *6/18*

U.S. Cl. 55—263 **5 Claims**



1. A steam distributor, in an air humidification system, with a fan for generating an air stream and with at least one steam nozzle located in the effective range of this air stream and connected to a steam source, wherein the steam nozzle has at least one elongate slit, the longitudinal axis of which lies at least approximately transversely to the air flow, the longitudinally extending limiting edges of this slit each ending at an acute angle, and forming sharp edges for the purpose of preventing water drops from adhering in the region of the slit.

4,508,552

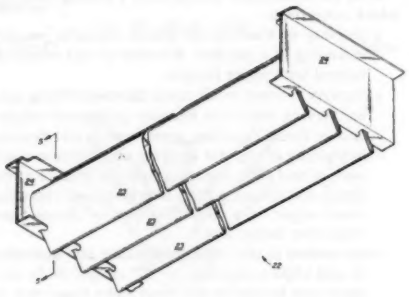
SELF-LOCKING MIST ELIMINATOR

John C. Ovard, 3465 Ridgeview Dr., Santa Rosa, Calif. 95404

Filed Feb. 2, 1981, Ser. No. 230,903

Int. Cl.³ B01D *45/16*

U.S. Cl. 55—440 **3 Claims**



1. In a self-locking mist eliminator for removing droplets of liquid entrained in a gas stream having a plurality of longitudinally extending eliminator blades positioned in side-by-side spaced apart relation for passing a gas stream transversely through the space between adjacent blades from an inlet to an

outlet, each blade having a front surface and a back surface, and a pair of end plates for supporting the opposite ends of said blades with each of said end plates having at least one notched flange extending longitudinally of the end plate and transversely of the blades and projecting toward the opposite end plate, the improvement comprising:

said notched flange of each of said end plates having a series of notched openings for receiving a portion of each of said blades,

each notched opening being enlarged in at least one direction longitudinally of the flange to provide an integral pin member adjacent the free edge of the flange and extending longitudinally of the flange,

each of said blades having at each end thereof at least one opening in the surfaces thereof,

said blade opening spaced from the end of the blade between said inlet and outlet edges of said blades for receiving one of said pin members with said pin members extending transversely of said blades for engagement between each blade and each end flange whereby each end of each blade is mechanically interconnected with one of said end plates.

2. A self-locking mist eliminator structure for removing droplets of fluid entrained in a gas stream comprising:

a plurality of longitudinally extending substantially hollow eliminator blades for positioning in side-by-side spaced apart relation for passing a gas stream transversely through the space between adjacent blades from an inlet to an outlet,

each blade having a front surface and a back surface and at least a pair of spaced-apart openings in the blade surfaces spaced inwardly from each end thereof, and

a pair of end plates for supporting the opposite ends of said blades,

each of said end plates having a pair of spaced-apart flanges projecting from one side thereof longitudinally thereof,

each of said flanges of said pair of plates having a series of notched openings for receiving a portion of each of said blades,

each said notched opening being enlarged in at least one direction lengthwise of the flange to provide an integral pin member extending lengthwise of the flange for engagement in one of said spaced-apart openings in said blade surfaces,

the entrance corners into each of said notched openings being chamfered whereby each end of each of said blades can be pressed toward an adjacent end plate and the hollow blade will deflect as the end enters one of said notched openings until the pin member adjacent thereto engages the blade opening transversely of the blade whereby each end of each blade is mechanically interlocked with one of said end plates.

4,508,553

PROCESS FOR COUNTERCURRENT CRYSTALLIZATION WITH RECIRCULATION

Henricus A. C. Thijssen, Son, and Bernardus G. M. van der Malen, Hagestein, both of Netherlands, assignors to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V., Utrecht, Netherlands

Filed Jul. 20, 1981, Ser. No. 284,947

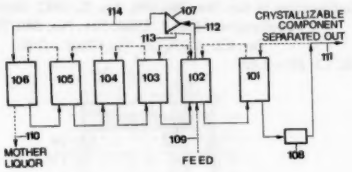
Claims priority, application United Kingdom, Jul. 24, 1980, 8024186

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.³ B01D *9/02*

U.S. Cl. 62—541 **12 Claims**

1. A process for separating one crystallizable component from a liquid containing a plurality of components, which comprises passing a stream of said liquid successively through at least part of a series of zones of successively lower temperatures including the zone of lowest temperature, so as to induce the formation of crystals of said one component in each of said zones, passing the crystals formed in each of said zones in a direction countercurrent to the direction of the stream of liquid through at least part of said zones, including the zone of highest temperature, separating the crystals present in the zone of highest temperature from their mother liquid and recovering at least part of these crystals, separating the crystals in the zone of



lowest temperature from their mother liquid and recovering that mother liquid, and introducing in one zone a portion of the crystals formed in a preceding zone other than the immediately preceding zone, said portion having a mean crystal size larger than the mean crystal size of the crystals formed in said one zone without said introduction of said portion.

4,508,554

PLASMA PROCESS FOR THE PRODUCTION OF A DIELECTRIC ROD

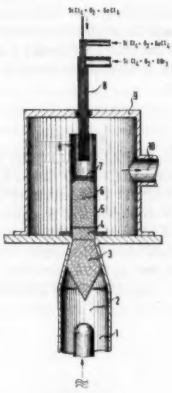
Hans Beerwald, Kall-Sistig; Guenter Boehm, and Guenter Glomski, both of Bochum, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 493,844

Claims priority, application Fed. Rep. of Germany, May 12, 1982, 3217839

Int. Cl.³ C03B *37/01*

U.S. Cl. 65—3.1 **16 Claims**



1. A plasma-based process for growing a dielectric rod from its corresponding gaseous starting materials, said process comprising conducting microwave energy in vacuo through the rod or a starting member for the rod to the end face of the rod or starting member, wherein said energy is effective to maintain a gaseous discharge at said end face, and simultaneously flowing said gaseous materials as a gaseous jet into the gaseous discharge by means of at least one nozzle, whereby said gaseous materials react with said end face to form a growing dielectric rod.

4,508,555

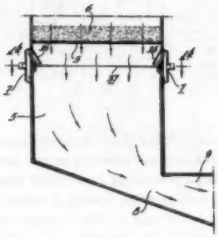
METHOD AND APPARATUS FOR SCRUBBING EFFLUENT GASES FROM MINERAL FIBER PRODUCTION

Guy M. Baduel, Terrasson, France, assignor to Isover Saint-Gobain, Paris, France

Continuation of Ser. No. 366,556, Apr. 8, 1982, abandoned. This application Mar. 1, 1984, Ser. No. 583,795

Int. Cl.[3] **C03C** *25/02*; **C03B** *37/06*

U.S. Cl. 65—3.43 **21 Claims**



1. A process for the manufacture of mineral fiber material comprising the steps of attenuating mineral fibers; coating the fibers with a finely divided liquid binder composition; entraining the coated fibers in a downwardly directed gaseous current in a forming hood having a foraminous conveyor in a lower region thereof movable transversely across the fiber-laden current; collecting fibers in the form of a blanket on the conveyor; directing the gaseous current passing through the conveyor into a gas receiving chamber below the conveyor having a width substantially equal to the width of the conveyor; providing a plurality of pairs of convergent jets of a scrubbing liquid in said gas receiving chamber to produce a substantially planar sheet of atomized scrubbing liquid coextensive with the cross-sectional area of said gas receiving chamber and disposed immediately beneath said conveyor and parallel thereto to intercept the gaseous current flowing downwardly therethrough; and accelerating the flow of the gaseous current following its passage through the atomized scrubbing liquid by directing said current into an off-take passage having a cross-sectional flow area substantially smaller than that of said gas receiving chamber.

4,508,556

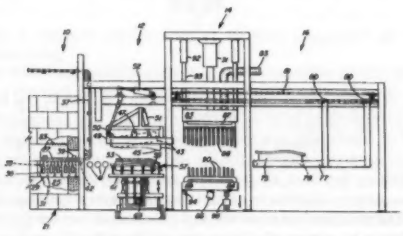
METHOD AND APPARATUS FOR BENDING GLASS SHEETS TO COMPLICATED SHAPES INCLUDING AN S-SHAPED TRANSVERSE BEND

Terry A. Bennett, Verona; George R. Claassen, New Kensington, and William B. Zimmerman, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 4, 1984, Ser. No. 616,764

Int. Cl.[3] **C03B** *23/035*

U.S. Cl. 65—25.4 **15 Claims**



1. Apparatus for shaping a hot glass sheet to a complicated shape comprising a longitudinal component of bend containing a concave element in elevation about a transverse axis of bending combined with a transverse component of bend of generally S-shaped configuration containing both convex and concave elements of bending to one side of the longitudinal axis of bending comprising

a shaping station including an upper vacuum shaping mold and a lower shaping mold having complementary shaping surfaces conforming to the shape desired for a heat-softened glass sheet,

a gaseous hearth bed having an upper surface below said upper vacuum shaping mold for supporting an arriving glass sheet thereover

means to provide motion in an essentially vertical direction to said lower shaping mold between a retracted position below said upper surface of said gaseous hearth bed and a glass sheet engaging position above said upper surface,

a ring-like member movable in an essentially horizontal direction between a downstream position beyond said shaping station and an upstream position between said upper vacuum mold and said upper surface of said gaseous hearth bed when said lower mold is in said retracted position, and

conveyor means for conveying said glass sheet into said shaping station along a path from a position upstream of said shaping station when said lower mold is retracted and said ring-like member is located downstream of said shaping station,

characterized by said upper vacuum mold having a downwardly facing surface curved in concave elevation transverse to said path and provided with a downwardly curved end portion in the downstream direction of said path, and

said upper surface of said gaseous hearth bed having a downwardly curved end portion in the downstream direction of said path permitting the downstream end portion of said glass sheet to flow downward as it arrives in position over said gaseous hearth bed.

11. A method of shaping a glass sheet having a longitudinal axis and a transverse axis to a complicated shape comprising, a longitudinal component of bend containing a concave element in elevation about a transverse axis of bending combined with a transverse bend including a component of bend of generally S-shape configuration about a longitudinal axis of bending containing both concave and convex elements of bending to one side of the center line of the glass sheet comprising,

orienting said glass sheet with its longitudinal axis extending transversely of a path of movement and with its portion destined to develop said component of bend of generally S-shape configuration disposed as the leading edge portion of said glass sheet,

conveying said sheet while so oriented along a path through a tunnel-like furnace and onto a gaseous hearth bed having a downwardly curved end portion downstream of said path such that the glass sheet is heated to its deformation temperature with its leading edge slightly hotter than its trailing edge en route to said downwardly curved end portion whereby said leading edge flows downwardly to sag toward said downwardly curved end portion,

supporting a vacuum mold having a downwardly curved downstream end portion superimposed over said downwardly curved end portion of said gaseous hearth bed in sufficiently spaced relation over said gaseous hearth bed to provide clearance for entry of said glass sheet between said vacuum mold and said gaseous hearth bed,

lifting said glass sheet on an outline shaping mold above said gaseous hearth bed and toward said vacuum mold with the sagged downstream end portion of the glass sheet supported on a rail portion of said outline shaping mold having an upper surface of S-shaped configuration in elevation about an axis extending transverse to said path,

applying vacuum to said vacuum mold when said lifted glass sheet nears the vicinity of said vacuum mold to engage said glass sheet by vacuum against said vacuum mold,

lowering said outline shaping mold while continuing to apply vacuum to engage said glass sheet by vacuum against said vacuum mold,

shuttling a ring-like member into position below said vacuum mold when said outline shaping mold is lowered sufficiently to provide clearance for said ring-like member,

discontinuing said vacuum to deposit said glass sheet onto said ring-like member, and

removing said glass sheet from below said vacuum mold while supported by said outline shaping mold.

4,508,557

DEAD PLATE ARRANGEMENT OF A GLASSWARE FORMING MACHINE

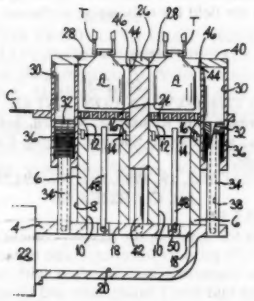
Frank A. Fenton, Wheatley, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jul. 5, 1983, Ser. No. 510,865

Claims priority, application United Kingdom, Jul. 9, 1982, 8219987

Int. Cl.³ C03B *35/12*

U.S. Cl. 65—348 **11 Claims**



1. A dead-plate arrangement for receiving a newly-molded glassware article in a glassware forming machine, cooling the article, and transferring the article to an exit assembly, comprising:

a dead-plate having a plurality of apertures;

a cooling assembly for drawing air downwardly through the apertures of said dead-plate;

an air-impervious shroud mounted relative to said dead-plate to move between operative and out-of-the-way positions, wherein in its operative position said shroud substantially surrounds the entire sidewall of the article while the latter is supported over the dead-plate, whereby air flows downwardly past the article's exterior walls through the dead-plate apertures; and

means for subsequently transferring the article to an exit assembly while the shroud is in its out-of-the-way position.

4,508,558

COMPOSITIONS CONTAINING UREA, AMMONIA, AND WATER

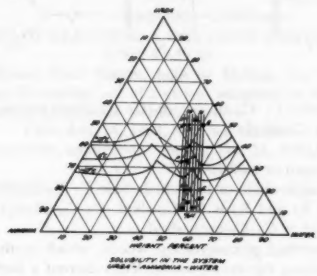
Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 14, 1982, Ser. No. 398,389

Int. Cl.³ C05C *9/00, 13/00*

U.S. Cl. 71—30 **45 Claims**

30. A fertilizing method for growing plants comprising distributing upon a soil an essentially completely liquid composition comprising urea, ammonia, and water wherein the total



nitrogen content due to dissolved urea and ammonia exclusively is between about 30 and 37 weight percent.

4,508,559

HERBICIDAL COMPOSITIONS

Garald E. Kollman, Libertyville, Ill., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 99,769, Dec. 3, 1979, abandoned, which is a continuation of Ser. No. 732,621, Oct. 15, 1976, abandoned. This application Jun. 20, 1983, Ser. No. 505,119

Int. Cl.³ A01N *37/48*

U.S. Cl. 71—83 **10 Claims**

1. A herbicidal composition comprising (a) a herbicide selected from the group consisting of 2-chloro-alpha, alpha, alpha-trifluoro-p-tolyl-3-carboxy-4-nitrophenyl ether and agronomically-acceptable salts thereof and (b) at least one water-soluble alkali metal, alkaline earth metal or ammonium salt of an acid selected from the group consisting of acetic acid, benzoic acid, oxalic acid, phosphoric acid, sulfuric acid, nitric acid, perchloric acid, carbonic acid, hydrobromic acid, and hydrochloric acid wherein the weight ratio of the herbicide to the water-soluble salt is about 3:1 to about 1:100.

10. In a process of combatting weeds in an agronomic crop locus, the improvement of spraying said weeds with an aqueous composition containing a combination of (a) 2-chloro-alpha,alpha,alpha-trifluoro-p-tolyl-3-carboxy-4-nitrophenyl ether, or an agronomically acceptable salt thereof, and (b) at least one water-soluble alkali metal, alkaline earth metal or ammonium salt of phosphoric acid, sulfuric acid, nitric acid, acetic acid or hydrochloric acid wherein the weight ratio of the herbicide to the water-soluble salt is about 3:1 to about 1:100, said aqueous composition being sprayed at about 5 to about 50 gallons of water per acre, the composition being applied at a rate of about 0.1 to about 12 pounds of the diphenyl ether herbicide per acre, the rate being sufficient to control the growth of the weeds.

4,508,560

CERTAIN PYRIDYLACETYLENE COMPOUNDS, COMPOSITIONS CONTAINING SAME AND HERBICIDAL METHODS OF USE

Hans-Georg Brunner, Lausen; Rolf Schurter, Binningen, and Henry Szczepanski, Wallbach, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

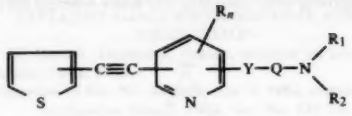
Filed Nov. 5, 1982, Ser. No. 439,456

Claims priority, application Switzerland, Nov. 11, 1981, 7257/81

Int. Cl.³ C07D *409/06;* A01N *43/40*

U.S. Cl. 71—94 **14 Claims**

1. A compound of the formula



wherein

R is cyano, C_1–C_4-alkoxy, di-(C_1–C_6-alkyl) amino, halogen or C_1–C_4-alkyl,

n is 0, 1 or 2,

Y is oxygen or sulfur,

Q is straight-chain or branched-chain C_2–C_6-alkylene,

each of R_1 and R_2 is C_1–C_6-alkyl, C_3–C_6-alkenyl, C_3–C_6-alkynyl or C_3–C_8-cycloalkyl.

12. A method of controlling weeds, which method comprises applying thereto or to the locus thereof a herbicidally effective amount of a compound according to claim 1.

4,508,561

1-PHENYLETHYL SULFONE DERIVATIVES OF 2-PYRIDYL-N-OXIDES AND HERBICIDAL COMPOSITIONS CONTAINING SAME

Gozyo Sakata; Tatsuo Numata; Kenzi Makino; Takuya Kakuta; Kazuya Kusano, all of Funabashi; Takasi Ikai, and Tosihiko Oguti, both of Shiraoka, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

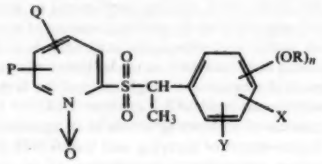
Filed Jan. 12, 1983, Ser. No. 457,381

Claims priority, application Japan, Jan. 22, 1982, 57-8702

Int. Cl.³ C07D *213/60*; A01N *43/40*

U.S. Cl. 71—94 **6 Claims**

1. A 1-Phenylethyl sulfone substituted by a halogenated alkyloxy group, represented by the formula



wherein

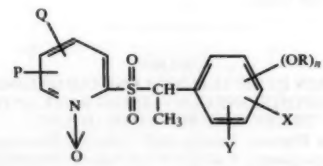
R is lower alkyl substituted by halogen,

n is 1 or 2,

each of P and Q is a hydrogen atom or lower alkyl and each of X and Y is hydrogen, lower alkyl or halogen.

2. A herbicidal composition comprising:

(a) an herbicidally effective amount of a 1-phenylethyl sulfone substituted by a halogenated alkyloxyl group, of the formula



wherein

R is lower alkyl susbstituted by halogen,

n is 1 or 2,

each of P and Q is hydrogen or lower alkyl, and

each of X and Y is hydrogen, lower alkyl or halogen; and

(b) a herbicidally acceptable carrier.

4,508,562

BENZYLSULFINYL PYRIDINE-N-OXIDES AND THEIR HERBICIDAL METHOD OF USE

Koji Nakayama, Osaka; Ryo Yoshida, Hyogo, and Hiroshi Matsumoto, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

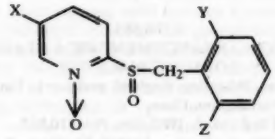
Filed May 27, 1983, Ser. No. 498,990

Claims priority, application Japan, May 28, 1982, 57-91929; Nov. 24, 1982, 57-206310

Int. Cl.³ C07D *213/71*; A01N *43/40*

U.S. Cl. 71—94 **4 Claims**

1. A compound of the formula:



wherein X is a chlorine atom or a bromine atom; and Y and Z, which may be the same or different, are each a chlorine atom or a fluorine atom.

4. A method for controlling weeds which comprises applying a herbicidally effective amount of the compound according to claim 1 to the field for cultivating soybeans, cotton, barley or rice.

4,508,563

REDUCING THE OXYGEN CONTENT OF TANTALUM

Walter J. Bernard, and Richard J. Millard, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Mar. 19, 1984, Ser. No. 591,293

Int. Cl.³ B22F *9/00*

U.S. Cl. 75—0.5 BB **16 Claims**

1. A process for reducing the oxygen content of tantalum to obtain a high CV product for electrolytic capacitors comprising intimately contacting said tantalum with an alkali metal halide, reacting said metal halide with said tantalum oxide out of contact with an oxygenated medium at a temperature of at most 1200° C. to form a corresponding alkali metal oxide, and then increasing said temperature to at most 1400° C. for at most 10 minutes to volatilize and expel any excess alkali metal halide.

4,508,564

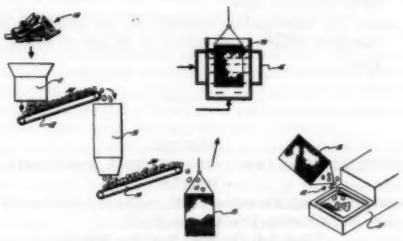
SCRAP METAL RECLAIMING PROCESS

James A. Kennedy, Newnan, Ga., assignor to The William L. Bonnell Company, Newnan, Ga.

Filed May 17, 1984, Ser. No. 611,138

Int. Cl.³ C22B *21/00*

U.S. Cl. 75—65 R **16 Claims**



1. A method for recycling aluminum scrap containing thermal barrier material, said method comprising the steps of:

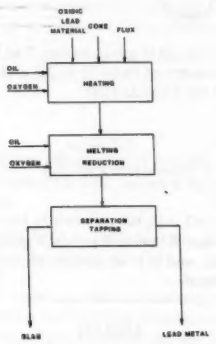
(a) comminuting said aluminum scrap to pieces less than about 24 inches in length thereby preparing a relatively uniformly sized aluminum scrap product;
(b) conveying said comminuted aluminum scrap product to a storage hopper;
(c) conveying the comminuted aluminum scrap product from said storage hopper to a fluidized bed furnace scrap container;
(d) transferring said fluidized bed furnace scrap container with said comminuted scrap product therein to a fluidized bed furnace;
(e) heating said aluminum scrap product in said fluidized bed furnace scrap container in said fluidized bed furnace to a temperature of about 600° to 1000° F. for a period sufficiently to substantially completely remove said thermal barrier material from said aluminum scrap product as combustible gas and cinder thereby producing a satisfactory aluminum melt furnace feed product in said fluidized bed furnace scrap container; and
(f) removing said fluidized bed furnace scrap container with said aluminum melt furnace feed product therein from said fluidized bed furnace; and
(g) transferring said aluminum melt furnace feed product from said fluidized bed furnace scrap container to an aluminum melt furnace for melting.

4,508,565

METHOD FOR PRODUCING LEAD FROM OXIDIC LEAD RAW MATERIALS WHICH CONTAIN SULPHUR

Johan S. Leirnes, Skelleftehamn; Malkolm S. Lundström, Skelleftea; Martin L. Hedlund, Ursviken, and Kurt J. A. Burén, Skelleftehamn, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Apr. 30, 1984, Ser. No. 605,660
Claims priority, application Sweden, May 2, 1983, 8302486
Int. Cl.[3] C22B *13/00*
U.S. Cl. 75—77 **12 Claims**



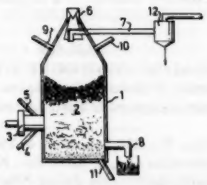
1. A method for producing lead having a sulphur content of less than about 2% from a sulphur-containing lead raw material contaminated with at least one of zinc and other oxidizable elements by smelting the material in a furnace in which the contents thereof can be agitated, said method comprising:
(a) introducing the lead raw material into the furnace together with an iron-containing flux and a solid reducing agent, said reducing agent being in an amount at least sufficient to reduce the lead content of the furnace to lead metal;
(b) heating and agitating the contents of the furnace whereby the lead raw material is reduced to lead having a sulphur content of less than about 2% and whereby a low lead content slag is formed composed of iron and zinc in a total amount of from 30 to 40%, SiO_2 in an amount of from 15 to 25% and CaO and MgO in a total amount of from 15 to 25%; and
(c) recovering the lead and the slag.

4,508,566

METHOD OF CLEANING A GAS FLOW CONTAINING ZINC VAPOR

Sune Eriksson; Sven Santén, both of Hofors, and Gotthard Björling, Djursholm, all of Sweden, assignors to SKF Steel Engineering Aktiebolag, Sweden

Filed Jan. 24, 1983, Ser. No. 460,500
Claims priority, application Sweden, Jun. 21, 1982, 8203831
Int. Cl.[3] C22B *19/04*
U.S. Cl. 75—88 **5 Claims**



1. A method of purifying and cooling a superheated gas mixture containing zinc vapor together with vapor of at least one metal having a boiling point higher than zinc, said gas mixture being obtained from reduction in a reduction shaft of material containing zinc oxide, comprising the steps of reducing the zinc oxide in the reduction shaft so as to obtain said superheated gas mixture, passing the gas mixture upwardly through said reduction shaft, contacting said gas mixture with a countercurrent flow of cooling metal droplets or particles by injecting said cooling metal droplets or particles into the top of the shaft, said material containing zinc oxide at least partially not comprising said metal droplets or particles, and thereby condensing the vapor of said at least one metal having a boiling point higher than zinc and cooling the zinc containing gas to almost the saturation temperature of the zinc vapor in said gas, passing the condensed metal downwardly through the shaft and passing the cooled zinc vapor to a condensor outside the shaft and condensing said vapor.

4,508,567

PRESS-MOLDING PROCESS FOR PREPARING A POWDER COMPACT

Shigeru Mizuno; Masahiko Suzuki; Haruki Mizuno, and Masutaro Katsu, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 24, 1982, Ser. No. 391,879
Claims priority, application Japan, Jul. 2, 1981, 56-103767
Int. Cl.[3] B22F *1/00*
U.S. Cl. 75—231 **9 Claims**

1. A flux-path forming member of a motor made of a compacted and cured mixture mass and having high radial crushing strength and density, said flux-path forming member being prepared by a process comprising:
a first step of preparing a mixture mass by evenly mixing not less than 0.2 percent by weight of thermosetting resin binder and not less than 0.1 percent by weight of molybdenum disulfide with not less than 96 percent by weight of a major portion of said mixture mass, said major portion being a member selected from the group consisting of metal powder, fibrous metal, and a combination thereof, the total content of said thermosetting resin and said molybdenum disulfide being not more than 4 percent by weight;
a second step of compacting in a mold under pressure said mixture mass into a predetermined shape; and

a third step of heating, concurrently with or subsequently to said second step, said mass to an elevated temperature to cure the binder portion thereof.

4,508,568

BIOCIDAL WOOD PRESERVATIVE COMPOSITION AND METHOD

Richard C. Fox, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 200,812, Oct. 27, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,558

Int. Cl.³ C09D *5/20*

U.S. Cl. 106—2 **12 Claims**

1. A preservative composition which comprises at least about 25% by weight of a petrolatum wax having an oil content equal to or greater than about 10 weight percent of the wax and an effective amount of a biocide.

4,508,569

SEALING COMPOUND FOR CANS

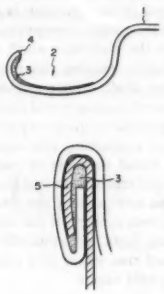
Hideo Kumasaka, Yokosuka, and Kazuo Fujisawa, Kawasaki, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 354,547, Mar. 4, 1982, abandoned. This application Oct. 6, 1983, Ser. No. 539,224

Claims priority, application Japan, Mar. 10, 1981, 56-33137

Int. Cl.³ C04B *9/02*

U.S. Cl. 106—14.12 **9 Claims**



1. In a can end formed from a surface-treated steel plate having an annular groove at the periphery thereof which comprises a gasket layer formed in the annular groove to seal the double-seamed portion between the can end and a can body, the improvement wherein said gasket layer is formed by lining a sealing compound in the annular groove, said sealing compound comprising as a base component an aqueous latex of a styrene-butadiene rubber which contains styrene and butadiene at a weight ratio of from 28/72 to 55/45, said latex containing as a particle size-adjusting agent an alkali metal carbonate or an alkali metal salt of a phosphorus oxyacid in an amount of 0.3 to 2.0 parts by weight per 100 parts by weight of solids of the styrene-butadiene rubber wherein the number average particle size of particles of the styrene-butadiene rubber is 1,600 to 3,000 Å.

8. A method for preventing rusting on the cut edge of a can end formed from a surfacetreated steel plate having an annular groove at the periphery thereof which comprises lining a sealing compound comprising as a base component an aqueous latex of a styrene-butadiene rubber which contains styrene and butadiene at a weight ratio of from 28/72 to 55/45, said latex containing as a particle size-adjusting agent an alkali metal carbonate or an alkali metal salt of a phosphorus oxyacid in an amount of 0.3 to 2.0 parts by weight per 100 parts by weight of solids of the styrene-butadiene rubber wherein the number average particle size of particles of the styrene-butadiene rubber is 1,600 to 3,000 Å in the annular groove and double-seaming the can end member to a can body whereby the sealing compound forms a gasket layer in the annular groove to seal the double-seamed portion between the can end and the can body.

4,508,570

AQUEOUS INK FOR INK-JET PRINTING

Tadashi Fujii, Yokohama; Tomoyuki Yamaguchi, Chiba; Kakuji Murakami, Kawasaki; Tomiko Kawakami, and Hiroko Uenozono, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 434,779

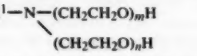
Claims priority, application Japan, Oct. 21, 1981, 56-167267; Oct. 29, 1981, 56-172053

Int. Cl.³ C09D *11/02*

U.S. Cl. 106—20 **22 Claims**

1. An aqueous ink for ink-jet printing comprising (i) a water-soluble dye, (ii) a wetting agent selected from the group consisting of a polyhydric alcohol, an alkyl ether of a polyhydric alcohol, and mixtures thereof, (iii) water, and (iv) at least one water-soluble non-ionic surface active agent selected from the group consisting of:

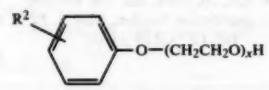
compounds of the formula (I):



(I)

wherein R^1 is a chain hydrocarbon group having 16 to 19 carbon atoms, m is an integer of from 0 to 18, and n is an integer of from 0 to 18, wherein m+n equals 8 to 18;

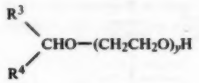
compounds of the formula (II):



(II)

wherein R^2 is an alkyl group having 7 to 12 carbon atoms, and x is an integer of from 12 to 20; and

compounds of the formula (III):



(III)

wherein R^3 and R^4 each is an alkyl group having 6 to 8 carbon atoms, and y is an integer of from 10 to 15, and mixtures thereof.

4,508,571

MOLD ADDITIVES FOR USE IN CONTINUOUS CASTING

Hakaru Nakato; Toshikazu Sakuraya; Yasuhiro Habu; Toshihiko Emi, all of Chiba; Masanori Kodama, Kurashiki; Takao Koshikawa, Chiba; Yoshimitsu Yoshida, and Fumitaka Shimokawa, both of Kobe, all of Japan, assignors to Kawasaki Steel Corporation and Sakai Chemical Industry Co., Ltd, both of Kobe, Japan

Filed Mar. 19, 1984, Ser. No. 591,030

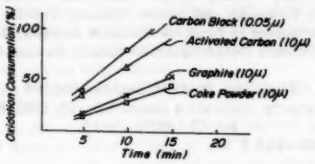
Claims priority, application Japan, Aug. 10, 1983, 58-145102

Int. Cl.³ B28B *7/34*

U.S. Cl. 106—38.28 **5 Claims**

1. In a mold additive for use in a continuous casting, which comprises a base material for slag having a chemical composition of $CaO—SiO_2—Al_2O_3$ system, a flux composed of at least one substance selected from the group consisting of fluorides and carbonates of alkali metals and alkaline earth metals, and a

carbonaceous aggregate as a melting rate adjuster the improvement comprising, as said carbonaceous aggregate, carbon black and activated carbon having an average particle size of



not more than 10 μm and in amounts of 0.5–2.0% by weight and 1–4% by weight, respectively, wherein the bulk density of the mold additive is not more than 0.9 g/cm^3.

4,508,572

CEMENT COMPOSITION FOR LAYING UNDERWATER

Masaharu Sakuta, Tokyo; Soichi Kiya, Hachioji; Iwao Uchizaki, Tokyo; Yasuhiko Yoshioka, Mitaka; Koichi Ito, Tokyo; Tadahiro Kaya, Kanagawa; Tsunetoshi Shioya; Yoshifumi Shimoyama, both of Fujisawa, and Hiroyuki Yamakawa, Yamato, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka; Takenaka Doboku Co., Ltd. and Sankyo Chemical Industries Ltd., both of Tokyo, all of, Japan

Filed Jun. 23, 1983, Ser. No. 506,971

Claims priority, application Japan, Jul. 30, 1982, 57-131904

Int. Cl.^{3} C04B *7/02*

U.S. Cl. 106—90 **8 Claims**

1. A cement composition for laying underwater, comprising cement and a polyacrylamide compound, wherein said polyacrylamide compound is present in an amount ranging from 0.1 to 3% by weight of said cement, and a dialdehyde.

4,508,573

CO-PRODUCTION OF CEMENTITIOUS PRODUCTS

Philip H. Harris, Arlington, Tex., assignor to Texas Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 326,614, Dec. 2, 1981,. This application Mar. 9, 1983, Ser. No. 473,535

Int. Cl.^{3} C04B *7/44*

U.S. Cl. 106—100 **10 Claims**

1. A method of reducing sulfur containing contaminants in emission gases from a coal burning furnace comprising

(a) forming an intimate mixture of coal and reactant material containing calcareous and aluminous materials by intergrinding coal with said reactant material wherein said interground intimate mixture has a majority of particles less than 100 mesh (U.S. Sieve), said reactant material being added in sufficient quantity to provide a stoichiometric ratio of reactant material to sulfur dioxide combustion contaminants of coal of from about 0.5 to about 3;

(b) suspending said interground mixture in an oxygen-containing gas stream and passing said stream to a flame maintained at about 2000° F. to about 3000° F. by coal combustion within said furnace; and

(c) burning said coal in said oxygen-containing gas stream thereby releasing sulfur dioxide combustion contaminant from coal which reacts with reactant material to form a thermally stable compound in the lime-alumino-sulfate series.

4,508,574

PROCESS FOR IMPROVING THE FLUIDITY AND CONVEYABILITY OF MOIST CALCIUM SULFATE PRECIPITATES

Hans-Friedrich Kurandt, Luenburg, and Karl-Heinz Kampner, Embsen, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls Ag, Marl, Fed. Rep. of Germany

Filed Oct. 25, 1983, Ser. No. 545,241

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1982, 3239768

Int. Cl.^{3} C04B *11/10*

U.S. Cl. 106—109 **7 Claims**

1. A process for preparing a fluid and conveyable moist calcium sulfate precipitate from calcium sulfate precipitates, having a free water content of more than about 5% by weight, which comprises adding quicklime (CaO) burned dolomite (CaO+MgO) or a mixture thereof, in finely ground form to said water-containing calcium sulfate precipitate in the amount of about 15–60 percent by weight, based upon the calcium sulfate content, to form a homogeneous mixture of the same; and wherein about 0.5 to 0.9 moles of finely ground quicklime, burned dolomite or a mixture thereof are added per mole of free water in said moist calcium sulfate precipitate.

4,508,575

PROCESS FOR PRODUCING IVORYLIKE MATERIAL FOR KEYS OF MUSICAL INSTRUMENTS

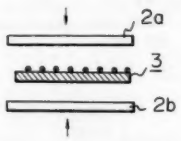
Yutaka Oshima, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Sep. 20, 1983, Ser. No. 533,879

Claims priority, application Japan, Sep. 20, 1982, 57-163544

Int. Cl.^{3} C08L *89/00*

U.S. Cl. 106—148 **28 Claims**



1. A process for producing ivorylike material for keys for musical instruments, comprising the steps of providing a first casein composition of a first color comprising a filler, coloring agent and water; providing a second casein composition having a second color different from the first color, said second casein composition comprising filler, coloring agent and water and being in the form of a sheet; extruding said first casein composition through a dye to form thin linear bodies on said sheet arranged in a predetermined orientation so as to simulate the surface of ivory; and heat pressing said oriented sheet so as to form a heat pressed oriented sheet; and impregnating said heat pressed oriented sheet with formalin for hardening.

4,508,576

HOT-WATER DISPERSIBLE CORN STARCH HAVING HIGH PASTE VISCOSITY

John P. Mudde, Oak Lawn, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Oct. 18, 1983, Ser. No. 542,952

Int. Cl.^{3} C13L *1/08;* C08L *3/00*

U.S. Cl. 106—213 **10 Claims**

1. A process for the treatment of corn starch which comprises the steps of

(a) mixing

(i) a starch component comprising granular corn starch,

(ii) a surfactant component comprising at least one surfactant containing a fatty acid moiety, and

(iii) water in the amount of about 43% to about 50% by

weight of the combined mixture, any portion of which water may be present as the natural moisture content of said starch component, to form a uniform mixture;

(b) heating the mixture of Step (a) at a temperature from about 50° C. to about 85° C. for at least 1 hour in a closed container; and

(c) subjecting the product of Step (b) to microwave radiation in an open container until the moisture content of the mixture is reduced to below about 15% by weight;

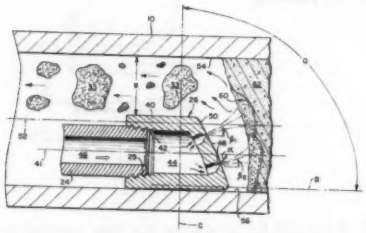
to produce a starch product having substantially complete hot-water dispersibility capable of forming a 5% dispersion when added to boiling water, said dispersion having a viscosity of at least about 2000 centipoises when measured at 70° C.

4,508,577

FLUID JET APPARATUS AND METHOD FOR CLEANING TUBULAR COMPONENTS

Andrew F. Conn, Baltimore; William T. Lindenmuth, Columbia, and Gary S. Frederick, Reisterstown, all of Md., assignors to Tracor Hydronautics, Inc., Laurel, Md.

Filed Apr. 29, 1983, Ser. No. 489,771
Int. Cl.³ B08B *9/02*
U.S. Cl. 134—1 **35 Claims**



14. A method for cleaning material from the inside of a tubular component with high velocity fluid jets comprising:

positioning a nozzle body adjacent to one wall of the tubular component so that the body is offset relative to the axis of the component, the nozzle body having at least two fluid jet forming means mounted on its forward end for directing a plurality of angled high pressure fluid cutting jets in a direction forward of the nozzle body, the angle of the jets being such that they are only directed toward the wall of the tubular component opposite said one wall and the nozzle body being located so that the cutting jet of at least one of the jet forming means will be directed across the axis of the tubular component;

providing high pressure fluid to the jet forming means;

moving the tubular component and the nozzle body so that the nozzle body moves around and remains adjacent to the inside wall of the tubular component; and

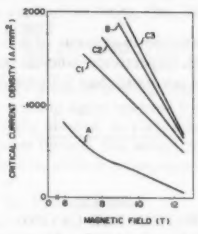
advancing the nozzle body into the tubular component as the material is eroded whereby the fluid jets form an asymmetric cutting pattern on the surface of the material being eroded and the counterthrust of the fluid jets keeps the nozzle body offset relative to the axis of the tubular component and against said one wall of the tubular component to provide passage for removal of the eroded material and spent fluid out of the end of the tubular component.

4,508,578

METHOD OF MANUFACTURING FINE FILAMENTARY NB-TI BASED ALLOY SUPERCONDUCTING WIRE

Hitoshi Wada, Toride; Kyoji Tachikawa, Tokyo; Yutaka Yamada, Kawasaki, and Satoru Murase, Yokohama, all of Japan, assignors to National Research Institute, Tokyo and Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, both of, Japan

Filed Nov. 29, 1983, Ser. No. 556,099
Claims priority, application Japan, Nov. 29, 1982, 57-207642
Int. Cl.³ H01L *39/12*
U.S. Cl. 148—11.5 F **12 Claims**



1. A method of manufacturing a fine multifilamentary Nb-Ti based superconducting wire comprising:

a first step of processing an alloy consisting essentially of 10 to 50 atomic % of niobium, 40 to 75 atomic % of titanium and no higher than 30 atomic % of at least one element selected from a group consisting of hafnium, tantalum and tungsten to form an alloy wire;

a second step of covering said alloy wire with a stabilizer, cold drawing the resultant wire, bundling a plurality of stabilizer-clad wires thus obtained, covering the bundle of wires with a stabilizer, and extruding and cold drawing the resultant bundled wires to thereby form a multifilamentary wire; and

a third step of thermally treating said multifilamentary wire at a temperature of 250° to 600° C. and drawing the resultant treated filamentary wire to a reduction rate of 30 to 99.9%,

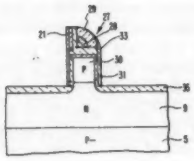
said third step being carried out more than once.

4,508,579

LATERAL DEVICE STRUCTURES USING SELF-ALIGNED FABRICATION TECHNIQUES

George R. Goth, Poughkeepsie, and Shashi D. Malaviya, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1981, Ser. No. 248,918
Int. Cl.³ H01L *21/20, 21/28*
U.S. Cl. 148—175 **9 Claims**



1. A process for forming a semiconductor pedestal structure of tightly controlled width, comprising the steps of:

providing a body of semiconductive material;

providing a first insulating layer on said body of semiconductive material;

providing a first polysilicon layer over a first portion of said insulating layer leaving a second portion of said insulating

layer exposed, said first polysilicon having a substantially vertical surface extending between said first and second portions;

providing a second insulating layer conformally over said first polysilicon layer including said vertical surface thereof and said exposed second portion of the first insulating layer, said second insulating layer over said vertical surface serving as a sidewall;

providing a second polysilicon layer conformally over said second insulating layer;

anisotropically etching said conformal second polysilicon layer forming a stud of said second polysilicon abutting said sidewall with the width of said polysilicon stud defined by the thickness of said conformal second polysilicon layer;

thermally oxidizing said polysilicon stud to convert said polysilicon stud into an essentially silicon dioxide stud;

removing said first polysilicon layer and the second insulating layer provided thereover to leave said oxide stud self-supporting and flanked on one side by said second insulating layer sidewall; and

forming a protrusion of said semiconductive material on a pedestal thereof with the width of said protrusion defined by the width of said self-supporting stud by anisotropically etching said body of the semiconductive material surrounding said self-supporting stud using said self-supporting stud as a mask

whereby a semiconductor pedestal structure of tightly controlled width is formed.

4,508,580

INCENDIARY MIXTURE CONSTITUTED OF METALS

Martin Klöber, Nuremberg, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,708

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3245907

Int. Cl.³ C06B *45/10*

U.S. Cl. 149—19.91 **12 Claims**

1. In an incendiary mixture containing metals with at least one oxygen-supplying metal oxide and an organic binder; and a nitrate, chlorate, perchlorate or peroxide selected from the group consisting of sodium, potassium, lithium, strontium, and ammonium and the chlorate, perchlorate or peroxide of barium comprising the improvement where the oxygen-supplying component consists of at least one oxygen-yielding compound selected from a member of the group consisting of barium nitrate, lead-IV-oxide and iron-III-oxide and mixtures thereof; at least one pyrophoric component selected from the group consisting of magnesium alloys, aluminum alloys or zirconium; and a castable acrylic synthetic resin binder.

4,508,581

METHOD FOR PRODUCING LINING PANELS WHICH ARE CAST INTO CONCRETE AS AN INTEGRAL LINING

Ernst Rohringer, Hilgert, Fed. Rep. of Germany, assignor to Steuler-Industriewerke GmbH, Grenzhausen, Fed. Rep. of Germany

Filed Mar. 9, 1982, Ser. No. 356,469

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3108972

Int. Cl.³ B29C *27/08*

U.S. Cl. 156—73.1 **7 Claims**

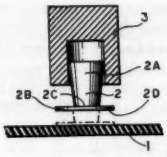
1. A method of producing large area lining panels for poured concrete structures, the method comprising the steps of:

providing a sheet-like panel composed of thermoplastic material, each panel having a front face and a rear face;

providing a plurality of affixing knobs composed of thermoplastic material, each affixing knob having a body with a first end and a second end and an attachment portion integrally formed at the first end of the body, the attachment portion having a contact surface with an area substantially larger than the cross-sectional area of the first end of the body;

placing the contact surface of the attachment portion of each affixing knob in contact with the rear face of the panel in predetermined spaced relation to other ones of the plurality of knobs; and

effecting frictional heating of the immediate region of contact between each affixing knob and the panel sufficient to fuse the contact surface of the knob and the contacted surface of the panel to weld the affixing knobs to the panel, whereby the enlarged attachment portion of each knob is adapted to distribute shear and tension forces exerted between the knob and the panel, when the knob is embedded in a poured concrete structure abutting the rear face of the panel, over a weld area greater than the cross-sectional area of the first end of the knob.



4,508,582

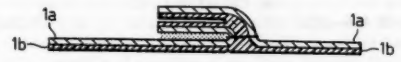
PROCESS FOR JOINING POLYURETHANE COATED FABRICS

Hans Fink, Möhlin, Switzerland, assignor to Bata Schuh AG., Möhlin, Switzerland

Filed Feb. 6, 1984, Ser. No. 577,024

Int. Cl.³ B32B *31/16, 7/08*

U.S. Cl. 156—93 **2 Claims**



1. A process for forming a pressure-tight and tension-proof joint between fabric substrate comprising the steps of

coating one side of each substrate with a layer of polyurethane,

placing the substrates adjacent each other with the polyurethane layers together,

applying pressure to a selected region near an edge of the adjacent fabric substrates and inductively heating the selected region so that the polyurethane material in the selected region is welded together,

sewing a seam along the region so that the stitching passes through the weld thus formed,

folding over and adhering the material of the welded substrates along the welded region so that a portion of one of the substrates along the selected edge lies against and is bonded to itself, and

separating and spreading out the remainder of the coated fabric substrates.

4,508,583

METHOD OF RECLAIMING ELECTRIC MOTOR LAMINATIONS

John A. Beavers, and Willard F. North, both of Claremore, Okla., assignors to Hughes Tool Company, Houston, Tex.

Filed May 23, 1984, Ser. No. 612,974

Int. Cl.³ B32B *35/00*

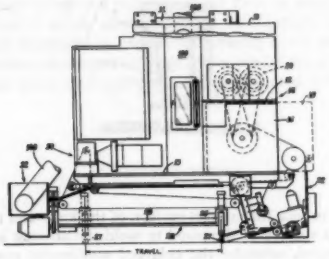
U.S. Cl. 156—94 **5 Claims**

1. For an elongated electric motor of the type having a stator stationarily mounted in a housing and composed of laminations

having slots containing windings and filled with a liquid filler which hardens to encapsulate the windings, an improved method of reclaiming the laminations for reuse, comprising in combination:

(a) removing the stator from the housing;

(b) securing portions of the stator with two grippers, one of which is movable relative to the other;



(c) moving one of the grippers apart from the other, separating a section of the stator from the remaining portions of the stator and pulling windings from the separated section; then

(d) resecuring the stator and repeating step (c) to provide a plurality of sections free of windings; and

(e) removing residual filler from the sections and separating the sections into individual laminations.

4,508,584

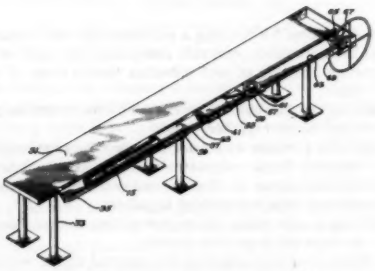
TAPE-LAYING HEAD

Paul A. S. Charles, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed Dec. 1, 1983, Ser. No. 556,922

Int. Cl.[3] B32B *31/00*

U.S. Cl. 156—353 **7 Claims**



1. In a machine head for laying a tape of composite material from a two-ply tape consisting of a layer of said composite material laminated to a strippable backing tape,

said machine head being adapted for suspension from the movable carriage of a gantry or the like which provides controlled linear movement of the carriage above, and along three rectilinear axes with respect to, a laying surface positioned to receive the composite material from said machine head and which provides controlled rotation of a portion of the carriage about a vertical axis,

said machine head comprising

a frame adapted to be secured in suspension from the rotatable portion of said movable carriage,

a tape supply mechanism mounted on the frame and comprising a power-driven restraining spindle removably engageable with the hub of a supply reel of said two-ply tape,

a tape guide for conducting said two-ply tape from the supply reel,

a flying shear disposed along said tape guide and operable to sever the composite material transversely of the two-ply without severing the backing tape,

a tape-laying mechanism for laying a severed length of the composite material upon said surface,

a take-up mechanism for conveying the backing tape away from the tape-laying mechanism, and

a control mechanism for synchronizing the operations of said gantry carriage, said tape-supply mechanism, said shear, said tape-laying mechanism and said take-up mechanism to effect the laying of a predetermined length of composite material in tape form upon a laying surface between two points on said surface,

the improvement wherein the tape-laying mechanism comprises

a subcarriage reciprocable along a horizontal track on the frame of the machine head from and to a normal position adjacent the delivery end of the tape guide,

a yoke vertically reciprocable on said subcarriage, a tape presser roll journalled in said yoke and about which the backing tape is trained between the tape guide and the take-up mechanism,

power-operated means for urging said yoke resiliently toward said laying surface to implant the composite material of said two-ply tape upon said surface, said yoke being normally raised on the subcarriage to maintain the presser roll and entrained tape above said laying surface,

a power-operated tape clamp on said subcarriage engagement with said presser roll in its normal raised position to secure the backing tape thereto,

a power-driven mechanism for advancing and retracting said subcarriage through a variable measured distance between selected points along said track,

said control means synchronizing the operations of said subcarriage, flying shear, tape clamp, roll yoke and take-up mechanism to maintain the engagement of the tape clamp with the presser roll as the subcarriage advances thereby to draw a measured length of the two-ply tape from the tape guide and a corresponding length of backing tape from the take-up mechanism, to release the clamp and to cause the presser roll to implant the end of a severed length of the composite material upon said laying surface, and then to roll back over the two-ply tape to press said severed length to the laying surface while simultaneously removing the backing tape from the laid composite material and from the laying site.

4,508,585

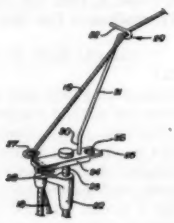
APPARATUS FOR FABRICATING COAXIAL CABLE

David L. Frakes, 18382 Gothard, Huntington Beach, Calif. 92648

Filed Feb. 25, 1983, Ser. No. 469,794

Int. Cl.[3] B65H *81/00*

U.S. Cl. 156—393 **2 Claims**



1. For use with a carrier device for braiding the conductive

sheath of coaxial cable, an improved apparatus for positioning a plurality of planetary, flattened, conductive strands, the improvement comprising:

(a) a plurality of mounting shafts coupled to the carrier device;

(b) a pair of cylindrical pins each projecting from one of said mounting shafts;

(c) a horizontal flange rotatably coupled to each of said mounting shafts, said horizontal flange having at one end thereof positioning means for deflecting the position of the flattened conductive strand upwardly from said horizontal flange said positioning means comprising a positioned shaft perpendicular to said horizontal flange and said mounting shaft and being rotatable about an axis, said positioned shaft depending into a directional positioner adapted to receive the flattend conductive strand; and

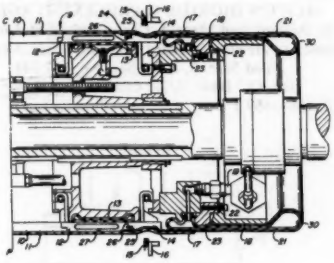
(d) a planetary braiding guide coupled to said horizontal flange on the opposide side of said mounting shaft as said positioning means and extending upwardly from said horizontal flange opposite to said mounting shaft, said braiding guide including means for positioning the flattened conductive strand adjacent the coaxial cable whereby a conductive strand is consecutively disposed about said cylindrical pins through said positioning means and adjacent said braiding guide.

4,508,586

TIRE BEAD TURN-UP DEVICE

Robert L. Brown, Akron; William A. Jones, Mogadore, and Daryl E. Anderson, Akron, all of Ohio, assignors to GenCorp Inc., Akron, Ohio

Filed Sep. 9, 1983, Ser. No. 530,799
Int. Cl.³ B29H *17/22*
U.S. Cl. 156—401 **9 Claims**



1. A tire building drum, comprising:

(a) a cylindrical outer shell on which at least one carcass ply of unvulcanized rubber material is layered, the shell having a pair of opposing ends adjacent which lay the opposing ply endings of a carcass ply when layered on the shell which also has a longitudinal center axis and a center plane which divides the shell in half longitudinally;

(b) a pair of annular, inflatable turn-up bladders adjacent the opposing ends of the shell, the bladders each having a reversely bent inboard end which is at least partially covered by the ply endings and a reversely bent outboard end which is farther from the centerplane of the shell than the inboard end;

(c) a plurality of bead lock segments adjacent each of the opposing ends of the shell, the segments being simultaneously movable in radial directions from the center axis of the shell and designed to move a tensioning means of the play endings and the adjacent juxtaposed ply endings into compressive engagement with a pair of tire bead rings when said rings are positioned around the shell axially inwardly of the ply endings, each of the bead lock segments including a bead seat which is in radial alignment with the tire bead rings when the rings are in position around the shell, and each of the bead seats being a curved depression which extends inwardly of the segments in the direction of the center axis of the shell;

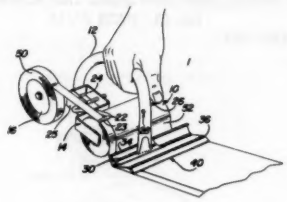
(d) a tensioning means interposed between the ply endings and bladders and separate from the bladders, including a separate carrier at each of the opposing ends of the shell, each carrier being a piece of material which is inextensible at least longitudinally of the shell and which has (i) an annular inboard end anchored to the drum axially inwardly of the bead seats, and (ii) an annular outboard end anchored to the drum axially outwardly of the bead seats, the carriers being sized and shaped to cover the adjacent bead seats and snugly fit around the outboard ends of the bladders as well as at least a portion of the outer exposed surfaces of the bladders between the inboard and outboard reversely bent portions thereof.

4,508,587

MASKING PAPER AND TAPE DISPENSER

Travis L. Hunter, 652 Juniper, Upland, Calif. 91786

Filed Oct. 27, 1983, Ser. No. 546,362
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—527 **5 Claims**



1. A masking paper and tape dispensing machine comprising:

an elongated tubular frame member having a first end and a second end, the tubular frame member being curved and of such a dimension to directly provide a central handgrip consisting of a portion of the frame between the first and second ends;

a roller mounting bracket attached to the first end of the frame;

a paper roller drum having an axis of rotation attached to the mounting bracket and extending into the opening between the first and second ends of the frame;

a tape roller drum having an axis of rotation attached to the mounting bracket with the axis of rotation aligned with the axis of rotation of the paper roller and positioned such that the dispensing path of a roll of tape mounted on the tape roller drum is aligned with generally one end of the paper roller drum;

a blade mounting bracket attached to the second end of the frame; and

a blade mounted on the blade mounting bracket and having a blade edge aligned with the axis of the paper roller drum.

4,508,588

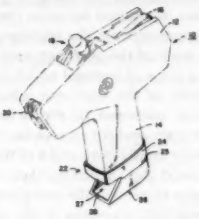
SCRAPER FOR REMOVING LABELS OR THE LIKE

John T. Parrish, 14244 NE. 124th St., A-103, Kirkland, Wash. 98003

Filed Aug. 15, 1983, Ser. No. 523,647
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—584 **8 Claims**

6. A labeling gun of the type comprising a main body portion which houses and dispenses labels and a handle portion which depends therefrom, the improvement comprising: a scraper

mounted to the lower portion of the handle, the scraper including a blade positioned on the leading edge thereof to enable the



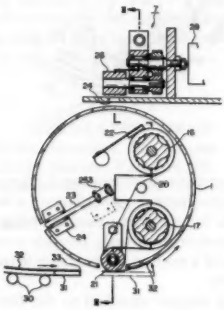
user of the gun to apply and remove labels with a two stroke motion.

4,508,589

PROTECTIVE COATING STRIPPING APPARATUS

Yuichi Tarui, and Toshio Obayashi, both of Hyogo, Japan, assignors to Marusho Industrial Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,615
Claims priority, application Japan, Dec. 8, 1982, 57-214011
Int. Cl.³ B32B *31/16*
U.S. Cl. 156—584 **5 Claims**



1. An apparatus for stripping a protective coating from a substrate comprising: a rotatable roller; adhesive means disposed at a peripheral portion of said rotatable roller; means for feeding a substrate carrying a protective coating toward said rotatable roller at a position such that an edge of said protective coating is contacted with said adhesive means; separating means mounted on said rotatable roller, behind, in a direction of rotation of said rotatable roller, said adhesive means, for separating a protective coating taken up onto an outer surface of said rotatable roller from said outer surface of said rotatable roller; and discharge means disposed adjacent said rotatable roller for receiving said protective coating from said separating means.

4,508,590

METHOD FOR THE DEPOSITION OF HIGH-QUALITY CRYSTAL EPITAXIAL FILMS OF IRON

Raphael Kaplan, 2347 N. Quantico St., Arlington, Va. 22205, and Nicholas Bottka, 5642 Mt. Burnside Way, Burke, Va. 22015

Filed Sep. 16, 1983, Ser. No. 532,938
Int. Cl.³ C30B *23/02*
U.S. Cl. 156—601 **15 Claims**

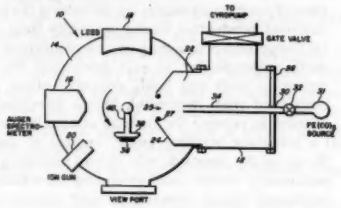
1. A method for forming a single crystal epitaxial film on the surface of a substrate, said method comprising the steps of:

positioning said substrate in an ultra-high vacuum (UHV) chamber wherein an ultra-high vacuum environment is maintained;

selecting a metalorganic vapor including ions of a first metal, said vapor having a deposition temperature T_D;

positioning a surface of said substrate at an entrance, within said UHV chamber, to a growth chamber, to approximately seal said entrance;

heating said substrate to about T_D;



exposing the surface of said heated substrate to said metalorganic vapor in said growth chamber to deposit a single crystal epitaxial film of said first metal upon the surface of said substrate while maintaining the ultra-high vacuum in said UHV chamber; and

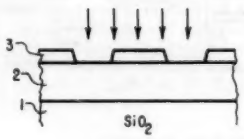
positioning said exposed surface of said substrate within said UHV chamber but away from said growth chamber entrance to facilitate examination in an ultra-high vacuum environment.

4,508,591

POLYMETHYL METHACRYLATE COMPATIBLE SILICON DIOXIDE COMPLEXING AGENT

Keith G. Bartlett, and Mary A. Caolo, both of Ft. Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 8, 1984, Ser. No. 587,348
Int. Cl.³ B44C *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—659.1 **4 Claims**



2. A method of dissolving silicon dioxide, which comprises the step of exposing the silicon dioxide to an etchant solution comprising:

an aqueous solution of ammonium fluoride from about 1% to about 20% by volume; and

citric acid from about 10 to about 200 grams per liter of aqueous solution.

4,508,592

ELASTOMER EXTRUSION DRYING WITH GAS INJECTION

Ronald C. Kowalski, New Providence, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 59,901, Jul. 23, 1979, abandoned, which is a continuation of Ser. No. 711,588, Aug. 4, 1976, abandoned. This application Dec. 7, 1982, Ser. No. 447,713
Int. Cl.³ B01D *1/28, 1/00*
U.S. Cl. 159—2.1 **18 Claims**

1. In the process for removing water from water-wet polymer particles by extruder explosion drying wherein said wet polymer particles containing about 0.5% to 16% by weight

water are obtained from a polymerization process in the form of an aqueous slurry and are introduced and moved through said extruder so that both temperature and pressure are progressively increased in a high compression zone and said polymer is brought to a maximum temperature just ahead of a restriction zone against which said pressure is applied and through which said polymer is explosively discharged, the improvement comprising producing exploded polymer particles containing less than about 0.3 weight % water by:

(a) maintaining the polymer particles in said compression zone under sufficient pressure to increase the temperature thereof to about 300° to 400° F.; and

(b) injecting 0.004 to 0.04 pound-moles of an inert gas per 100 pounds of polymeric material at one or more injection sites located along said compression zone, said inert gas being injected at a pressure in excess of the pressure in said compression zone and being capable of remaining in the gaseous state at pressures up to about 2000 psi and temperatures up to about 450° F.

4,508,593

PROCESS FOR RECOVERY OF SULFUR DIOXIDE LIBERATED IN THE CHEMICAL PULPING OF LIGNOCELLULOSIC MATERIAL

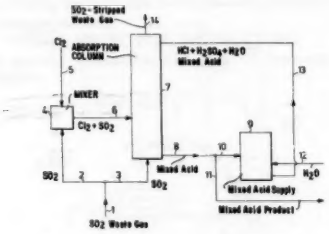
John R. Bergstrom, Domsjo, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Jun. 21, 1982, Ser. No. 390,584

Claims priority, application Sweden, Jun. 22, 1981, 8103892

Int. Cl.³ D21C *11/00, 11/06*

U.S. Cl. 162—29 **9 Claims**



1. A process for the recovery of sulfur dioxide liberated in the chemical pulping of lignocellulosic material, which comprises

(1) collecting sulfur dioxide-containing gas emitted during the pulping and separating it into at least two portions;

(2) contacting at least one portion with chlorine gas, thereby forming a gaseous mixture comprising sulfur dioxide and chlorine;

(3) effecting reaction of said sulfur dioxide, said chlorine, and water to form hydrochloric acid and sulfuric acid while forming an intimate dispersion in said gaseous mixture of an aqueous mixed acid solution comprising hydrochloric acid and sulfuric acid;

(4) dissolving said hydrochloric acid and said sulfuric acid in said aqueous mixed acid solution;

(5) recovering said aqueous mixed acid solution and separating it from substantially sulfur dioxide-free residual gas;

(6) washing the other portion of the sulfur dioxide-containing gas with the said aqueous mixed acid solution; and then

(7) combining said other portion with the gaseous mixture containing sulfur dioxide and chlorine and washing both with said aqueous mixed acid solution, while effecting the reaction of sulfur dioxide and chlorine.

4,508,594

POLYALDEHYDE/POLYACETAL COMPOSITIONS

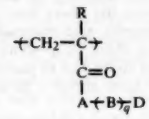
Roger H. Jansma, Park Forest, and Karen R. Sandberg, West Chicago, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jun. 28, 1984, Ser. No. 625,421

Int. Cl.³ D21H *3/38*

U.S. Cl. 162—135 **3 Claims**

1. A paper composition which comprises cellulosic fibers combined with an amount of a water-soluble polymer sufficient to increase the strength of the paper said water soluble polymer contains at least two mole percent of a monomer represented by the chemical structure:

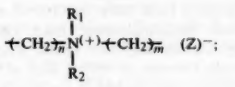


wherein

R is —H, —CH_3, or —C_2H_5; and

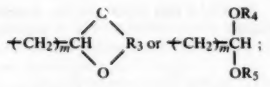
A is O, or N(R_1); and

B is CH_2, CH_2CH_2O, —$(CH_2)_nN(R_1)(CH_2)_m$,



and

D is



and

wherein R_1 is —H, —CH_3, —C_2H_5, $(CH_2CH_2O)_nH$, or $(B)_qD$, and wherein q is from 1–6, except when B contains nitrogen in which case q is always one; and wherein R_2 is —H, —CH_3, —C_2H_5, or $(CH_2CH_2O)_nH$; and wherein R_3 is

and wherein R_4 and R_5 may be the same or different and are, for each individual occurance, —H, —CH_3, or —C_2H_5; and wherein Z is from the group Cl, Br, I, NO_3, SO_4 and the like; and wherein m ranges from 0–6; and wherein n is from 1–6.

4,508,595

PROCESS FOR MANUFACTURING OF FORMED PRODUCTS

Stein Gasland, Dreyersvej 29, 2960 Rungsted Kyst, Denmark

Continuation of Ser. No. 245,753, Mar. 20, 1981, Pat. No. 4,377,440, which is a continuation of Ser. No. 42,222, May 24, 1979, abandoned. This application Mar. 21, 1983, Ser. No. 477,332

Claims priority, application Sweden, May 25, 1978, 78056934

The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.

Int. Cl.³ D21H *3/02*

U.S. Cl. 162—158 **2 Claims**

1. A method of making a shaped cellulosic paper or paper-

board article from a dilute aqueous suspension of cellulosic fibers, comprising the steps of:

(a) diluting cellulosic fibers with water to form a dilute aqueous suspension of less than 10 percent by weight cellulosic fibers;

(b) then agitating the dilute aqueous suspension of cellulosic fibers until the fibers become separated from each other and swollen;

(c) then dewatering the aqueous suspension to obtain an aqueous suspension of at least 20 percent weight cellulosic fibers;

(d) then preparing a homogenous, plastically formable material by adding to the suspension sufficient hydrocolloid to bind substantially all of the water in the material to prevent the water from bleeding out during subsequent shaping and to prevent the fibers from flocculating, and by kneading the material, said material containing water in the range of from about 50 to about 90 percent, fibers in the range of from about 8 to 49 percent, and hydrocolloid in the range of from about 1 to about 20 percent, by weight;

(e) shaping the material into the desired shape by extrusion, injection molding, rolling, pressing or drawing, and

(f) bonding the solids of the material by drying the shaped material.

4,508,596

APPARATUS FOR DRY COOLING OF COKE

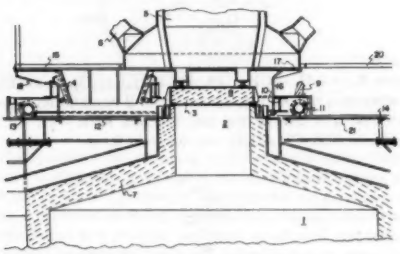
Heinrich Weber, Recklinghausen; Kürt Lorenz, Hattingen; Horst Dungs, Herne; Engelbert Brüns, Recklinghausen, and Gerd Osterholt, Dorsten, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 17, 1983, Ser. No. 458,269

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1982, 3202645

Int. Cl.[3] **C10B** *39/00, 39/16, 45/00*

U.S. Cl. 202—227 **8 Claims**



1. In combination with a transfer hopper associated with a housing cover, and a coke cooling pit having a charging hole and associated with a housing bottom spaced from said housing cover, a device for transferring hot coke from said transfer hopper to said charging hole, comprising:

rail means spaced from said charging hole and defining a lateral path;

a frame mounted for movement between said housing cover and said housing bottom for movement along said lateral path;

a plurality of connected side walls connected to said frame and movable with said frame along said lateral path, said side walls defining a housing space spanning a distance between said housing cover and said housing bottom for substantially closing said housing space and maintaining said hosing space closed with movement of said frame on said lateral path;

a charging hole closing shutter mounted to said frame and in said housing space;

shutter drive means connected between said frame and said shutter for moving said shutter upwardly and downwardly with respect to said frame;

an intermediate coke guide piece connected to said frame and disposed in said housing space for spanning a distance between said transfer hopper and said charging hole for guiding hot coke from said transfer hopper to said charging hole, said guide piece spaced lateraly of said shutter along said lateral path; and

a plurality of wheels rotatably mounted to said frame outside said housing space and engaged with said rail means for permitting movement of said frame along said lateral path, whereby said shutter drive means are operable to raise said shutter from said charging hole to permit movement of said frame along said lateral path to bring said guide piece into a position of alignment between said transfer hopper and said charging hole.

4,508,597

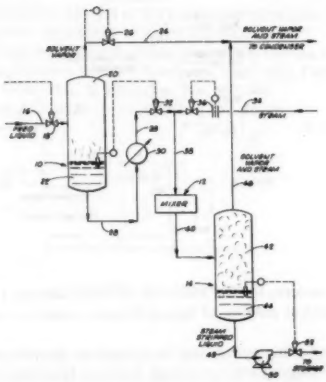
RECOVERY OF ORGANIC SOLVENTS FROM LIQUID MIXTURES

Jack W. Roach, Oklahoma City, Okla., assignor to Kerr-McGee Refining Corporation, Oklahoma City, Okla.

Filed Apr. 5, 1982, Ser. No. 366,040

Int. Cl.[3] **B01D** *3/38*

U.S. Cl. 203—79 **15 Claims**



1. A method of recovering light organic solvent from a liquid mixture containing the light organic solvent and a high molecular weight product material of supercritical solvent extraction processes, comprising:

treating the solvent-product material mixture in a first solvent separation zone to separate a first vapor phase rich in solvent and a first liquid phase rich in high molecular weight product material;

recovering solvent from the first vapor phase;

intimately contacting the first liquid phase with steam, under shearing conditions sufficient to provide a separation of solvent approaching up to one theoretical tray, in a mixing zone to produce a steam-liqud phase mixture;

treating the steam-liquid phase mixture in a second solvent separation zone to separate a second vapor phase rich in steam and solvent and a second liquid phase rich in high molecular weight product material; and

recovering solvent from the second vapor phase.

4,508,598

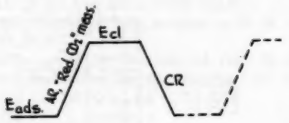
GAS SENSOR AND METHOD OF USING SAME

Jose D. Giner, Brookline, Mass., assignor to Giner, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 377,143, May 11, 1982, abandoned. This application Sep. 30, 1982, Ser. No. 430,688

Int. Cl.³ G01N 27/26, 27/42

U.S. Cl. 204—1 T 16 Claims



1. Method of quantitatively determining gas concentration in a fluid by (A) transforming gas from the fluid onto an electrode surface in contact with electrolyte as an adsorbed species; and (B) electrochemically determining quantitatively the amount of said adsorbed species.

4,508,599

METHOD AND APPARATUS FOR REGENERATION OF A COPPER-CONTAINING ETCHING SOLUTION

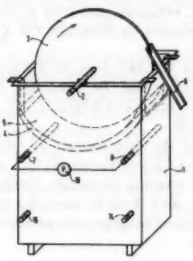
Rudi Ott, Markgroningen, and Heribert Reith, Stuttgart, both of Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 575,043

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 3303594

Int. Cl.³ C25C 1/12

U.S. Cl. 204—10 12 Claims



1. A method of regenerating a copper containing etching solution comprising copper (II) chloride and an alkali chloride as a sequestering agent from a spent etching solution containing copper (I) chloride comprising:

(a) passing said spent etching solution through an electrolytic reaction vessel containing an anode and cathode, said anode and cathode being separated by a porous diaphragm;

(b) operating said cathode at a current density of 40–400 A/dm² and said anode at current density of 1–100 A/dm², whereby chlorine is produced at said anode and metallic copper is deposited on said cathode, said chlorine reacting with said copper (I) chloride to form copper (II) chloride; and

(c) removing said deposited metallic copper from said cathode.

4,508,600

PROCESS FOR PREPARING ZN-NI-ALLOY-ELECTROPLATED STEEL SHEETS WITH EXCELLENT ADHERENCE OF THE PLATED LAYER

Taisuke Irie; Yoshitaka Nakagawa; Masayoshi Tatano, all of Osaka; Koichi Watanabe, Amagasaki, and Eiji Watanabe, Osaka, All of Japan, assignors to Nisshin Steel Company, Ltd., Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,601

Int. Cl.³ C25D 3/56, 5/10, 7/00

U.S. Cl. 204—27 3 Claims

1. A process for preparing Zn-Ni-alloy plated steel sheets with excellent adhesion of the plated layer comprising pre-plating a steel sheet in an acidic plating bath containing 7–38 g/l Zn and 41–88 g/l Ni whereby the concentration ratio $[Ni^{2+}]/([Zn^{2+}]+[Ni^{2+}])$ is 0.70–0.85 with an electric current density of 2–20 A/dm² at a temperature between 55° and 80 ° C. so that the resulting Zn-Ni pre-plated layer contains 12–87 wt % Ni; and electroplating said pre-plated steel sheet in an acidic electroplating bath containing 25–33 g/l Zn, 41–88 g/l Ni, 0.2–10 g/l titanium and 0.1–5 g/l aluminum or 0.2–4 g/l magnesium, the pH of which is 1.5–2.5.

4,508,601

PROCESS FOR PRODUCING A THIN TIN AND ZINC PLATED STEEL SHEET

Tadashi Nemoto, Kudamatsu; Ryoichi Fukumoto, Yamaguchi; Hiroaki Kawamura; Yoshikazu Kondo, both of Kudamatsu, and Tsuneo Inui, Tokuyama, all of Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,885

Int. Cl.³ C25D 5/48, 5/50

U.S. Cl. 204—38.5 21 Claims

1. A process for producing a thin tin and zinc plated steel sheet having 0.005–0.2 g/m² of zinc and 0.05–1.0 g/m² of tin which comprises:

(a) electroplating zinc on a substantially clean steel sheet in an aqueous electroplating bath containing zinc ions with or without additives,

(b) tinplating the zinc plated sheet of step (a) by immersion or by immersion followed by electroplating in an aqueous, acidic tin plating bath containing stannous ions, whereby zinc ions from the zinc plated steel sheet replace the stannous ions in the tinplating solution during the immersion tinplating and

(c) recycling the resultant solution from step (b), which contains zinc ions, to make up the zinc electroplating bath of step (a).

4,508,602

PROCESS FOR PRODUCING CONCENTRATED SOLUTIONS CONTAINING ALKALI METAL CHLORATES AND ALKALI METAL CHLORIDES

Jerry J. Kaczur, Cleveland, Tenn.; Steven A. Iacoviello, Naugatuck, and Edward G. Miller, Hamden, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 382,524, May 27, 1982, Pat. No. 4,434,033. This application Feb. 23, 1984, Ser. No. 582,653

The portion of the term of this patent subsequent to Feb. 28, 2001, has been disclaimed.

Int. Cl.³ C25B 1/26

U.S. Cl. 204—95 13 Claims

1. A process for producing a concentrated aqueous solution comprised of an alkali metal chlorate and an alkali metal chloride, the process which comprises:

conducting an electric current at an initial power load from a power controlling zone to a rectifying zone;

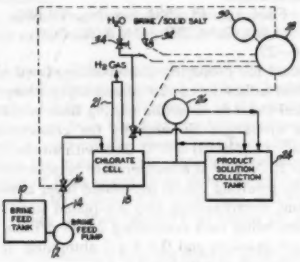
feeding an aqueous alkali metal chloride solution to an electrolysis zone;

supplying an electric current from said rectifying zone to said electrolysis zone at an initial current load to electrolyze said aqueous alkali metal chloride to produce a con-

centrated chlorate solution comprised of an alkali metal chlorate and the alkali metal chloride;

feeding a portion of said concentrated chlorate solution to an analysis zone;

analyzing said concentrated chlorate solution to measure the ratio of the concentration of the chlorate ion to the concentration of the chloride ion;



comparing in a processing zone said measured ratio with a predetermined value range for said ratio, and where said measured ratio falls outside of the predetermined value range for the ratio, altering the initial current load to said electrolysis zone; and

recovering said concentrated alkali metal chlorate solution.

4,508,603

FLUORINATED CATION EXCHANGE MEMBRANE AND USE THEREOF IN ELECTROLYSIS OF AN ALKALI METAL HALIDE

Hiroshi Ukihashi, Tokyo; Tatsuro Asawa, Yokohama; Masaaki Yamabe, Machida, and Haruhisa Miyake, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 718,424, Aug. 22, 1976, abandoned. This application Nov. 3, 1978, Ser. No. 957,453

Int. Cl.³ C25B *1/34, 13/08*

U.S. Cl. 204—98 **16 Claims**

1. A fluorinated cation exchange membrane comprising a copolymer of fluorovinyl ether (I) or a hydrolyzed copolymer thereof having the formula

$$CF_2{=}CF{-}O{-}CF_2{-}CFXOCF_2)_l(CFX')_m(C\text{-}F_2OCFX'')_n\,A$$

wherein l is 0 to 3; m is 2 to 6; m is 0 to 4 and one of l and n is not zero; X,X' and X'' are the same or different and each respectively is —F, or $-CF_3$; A is —CN,—COF, —COOH-,—COOR,—COOM or $CONR_2R_3$; R_1 is a $C_{1\text{-}10}$ alkyl group; R_2 and R_3 each respectively is hydrogen or a $C_{1\text{-}10}$ alkyl group; and M is an alkali metal or a quaternary ammonium salt; and a fluorinated olefin (II).

4,508,604

TRAVELING-WIRE EDM METHOD

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Mar. 18, 1983, Ser. No. 476,522

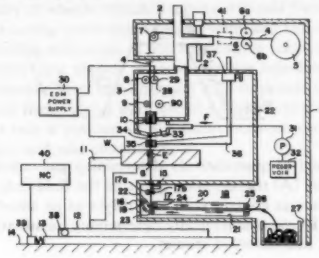
Claims priority, application Japan, Mar. 28, 1982, 57-48442

Int. Cl.³ C25F *3/02;* **B23P** *1/12*

U.S. Cl. 204—129.5 **13 Claims**

1. A method of machining a workpiece wherein an electrically conductive, continuous elongate element is axially transported from a supply side to a takeup side to form a traveling-wire machining electrode traveling continuously while being spanned taut across said sides and juxtaposed with the workpiece across a machining gap, an aqueous fluid medium is supplied to said gap, a machining voltage is intermittently applied across the traveling electrode and the workpiece to effect through the gap a succession of electrical discharges which electroerosively remove stock from the workpiece and cause decomposition of at least a portion of said aqueous fluid medium to form gases of oxygen and hydrogen in said gap, and said workpiece is displaced relative to the traveling-wire electrode transversely to the axis thereof along a predetermined path to machine the workpiece, the method including the steps of:

(a) attaching a polymeric substance to said electrically conductive, continuous elongate element so as to partially cover the surface thereof; and



(b) subjecting said elongate element traveling in machining juxtaposition with said workpiece to said electrical discharges to thermally decompose said polymeric substance, at least partly to form carbon and causing at least a portion of said gaseous oxygen and hydrogen to be chemically combined therewith to control the amount of these gaseous components in said machining gap.

4,508,605

NONAROMATIC DIANHYDRIDE AND POLYIMIDES FROM TRICYCLO[4.2.1.0^{2,5}] NONANE-3,4-DIMETHYL-3,4,7,8-TETRACARBOXYLIC ACID DIANHYDRIDE

Tayseer S. Nimry, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 294,347, Aug. 19, 1981, Pat. No. 4,358,582. This application Jun. 10, 1982, Ser. No. 386,890

Int. Cl.³ C07D *307/77*

U.S. Cl. 204—158 R **1 Claim**

1. A process for the manufacture of tricyclo[4.2.1.0^{2,5}]nonane-3,4-dimethyl-3,4,7,8-tetracarboxylic acid dianhydride which comprises reacting equimolar amounts of dimethylmaleic anhydride and 5-norbornene-2,3-dicarboxylic anhydride in the presence of toluene solvent wherein the reaction is irradiated by light.

4,508,606

PROCESS FOR TREATING POLYMER SURFACES TO REDUCE THEIR FRICTION RESISTANCE CHARACTERISTICS WHEN IN CONTACT WITH NON-POLAR LIQUID, AND RESULTING PRODUCTS

Joseph D. Andrade, 2059 Merrill Eng. Bldg. Univ. of Utah, Salt Lake City, Utah 84112; Philip M. Triolo, 1164 E. South Temple, Salt Lake City, Utah 84012; Lee M. Smith, Bldg, 518 Dept, Bio Eng. Univ. of Utah, and Frank J. Miller, 1C 402 Med. Center Univ. of Utah, both of Salt Lake City, Utah 84112

Continuation-in-part of Ser. No. 239,089, Feb. 27, 1983, abandoned. This application May 16, 1983, Ser. No. 495,209

Int. Cl.³ C07C *3/24*

U.S. Cl. 204—169 **12 Claims**

1. In a process wherein a hydrophobic polymer in contact with a layer of a non-polar liquid moves over the said non-polar liquid while it lays on another solid surface, the improve-

ment for reducing the friction reresistance accompanying such movement which comprises using as the hydrophobic polymer a hydrophobic polymer which has been, at least on the surface in contact with the non-polar liquid, subjected to an oxidation treatment so as to reduce the air-water contact angle of the surface below 50°.

4,508,607

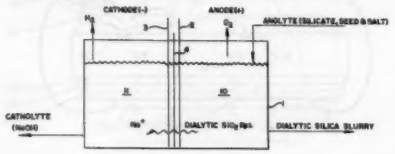
PARTICULATE DIALYTIC SILICA

Milton E. Winyall, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 434,764, Oct. 18, 1982, abandoned. This application Sep. 20, 1983, Ser. No. 533,206

Int. Cl.³ B01D *57/02;* **C25B** *1/00*

U.S. Cl. 204—180 P **15 Claims**



1. The process for preparing precipitated dialytic silica by electrodialysis which comprises:

(a) preparing an aqueous anolyte which contains a salt, and silica-containing seeds having a particle size of below 100 millimicrons;

(b) adding alkali metal silicate to the anolyte and subjecting said anolyte to electrodialysis to remove alkali metal ions at a pH of from about 5 to 10.5 and cause precipitation of silica; and

(c) recovering precipitated dialytic silica from said anolyte.

4,508,608

METHOD FOR MAKING CHALCOGENIDE CATHODES

David N. Palmer, Tolland, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 21, 1983, Ser. No. 487,157

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 C **6 Claims**

1. A method for making a high porosity chalcogenide cathode which comprises sputtering molecules of an intercalatable layered transition metal chalcogenide cathode active material onto and into a high porosity current collector substrate having a porosity of from about 10 to about 1000 pores per square inch to produce a coating of from about 0.5 to about 3 mils thickness by impinging a primary beam of argon ions onto a workpiece of said material at approximately 25–30 kiloelectron volts under a vacuum of 10^{-6} to 10^{-7} torr and directing a secondary beam of sputtered molecules of said material at said substrate.

4,508,609

METHOD FOR SPUTTERING A PIN MICROCRYSTALLINE/AMORPHOUS SILICON SEMICONDUCTOR DEVICE WITH THE P AND N-LAYERS SPUTTERED FROM BORON AND PHOSPHOROUS HEAVILY DOPED TARGETS

Theodore D. Moustakas, and H. Paul Maruska, both of Annandale, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 26, 1983, Ser. No. 535,902

Int. Cl.³ C23C *15/00;* **H01L** *31/18*

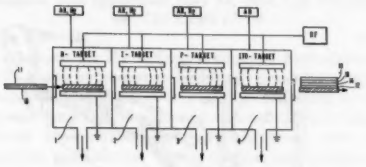
U.S. Cl. 204—192 S **25 Claims**

1. A metod for producing a hydrogenated silicon PIN semiconductor device comprising:

providing a substrate having at least a surface region including an electroconductive material which forms an ohmic contact to doped silicon;

reactively sputtering a layer of microcrystalline silicon doped with one type of charge carrier from a doped silicon target onto at least said surface region of the substrate in a total pressure of argon plus hydrogen >20 mTorr and $H_2/Ar>>1$;

reactively sputtering a layer of amorphous intrinsic, I, silicon from an undoped silicon target onto said layer of silicon doped with said one type of charge carrier;



reactively sputtering a layer of microcrystalline silicon doped with the other type of charge carrier from a doped silicon target onto said I layer in a total pressure of argon plus hydrogen >20 mTorr and $H_2/Ar>>1$;

sputtering an electroconductive material onto at least a region of said layer of silicon doped with said other type of charge carrier, which material forms an ohmic contact thereto.

4,508,610

METHOD FOR MAKING THIN FILM ELECTROLUMINESCENT RARE EARTH ACTIVATED ZINC SULFIDE PHOSPHORS

Eva C. Freeman, Lincoln, and Donald H. Baird, Newton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 27, 1984, Ser. No. 584,178

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 P **10 Claims**

1. A method of making a zinc sulfide electroluminescent thin film phosphor comprising the steps of:

(A) evacuating a sputtering chamber to a pressure suitable for sputtering, said sputtering chamber containing a substrate, a zinc sulfide sputtering target, and a rare earth sputtering target;

(B) adding to said sputtering chamber from step (A) a fill gas comprising an inert gas and hydrogen, said hydrogen being from about one to about 40 volume percent of said fill gas, said fill gas being held at a pressure from about 7×10^{-3} to about 10^{-2} Torr;

(C) co-sputtering from said zinc sulfide sputtering target and from said rare earth sputtering target in said fill gas held at said pressure to form a thin film zinc sulfide electroluminescent phosphor on said substrate.

4,508,611

APPARATUS FOR ELECTROPLATING AND CHEMICALLY TREATING THE CONTACT ELEMENTS OF ENCAPSULATED ELECTRONIC COMPONENTS AND LIKE DEVICES

Frank Johnson, San Jose; Dieter Reese, Simi Valley, and Louis Hirbour, Anaheim, all of Calif., assignors to Technic, Inc., Cranston, R.I.

Filed Jan. 31, 1983, Ser. No. 462,387

Int. Cl.³ C25D *17/06, 17/28*

U.S. Cl. 204—202 **15 Claims**

1. Improved apparatus for electroplating projecting contact elements of encapsulated electronic components, and their like, comprising:

a continuous, flexible conveyor belt of electrically conductive material;

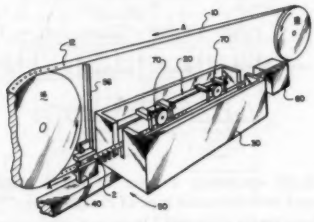
guide means for said conveyor belt, constraining the motion thereof into a closed loop defined by a substantially verti-

cal plane, with the web of said conveyor belt in substantially horizontal alignment;

passive engagement means defined by wedge-shaped edges of said conveyor belt for the frictionally-secured reception of portions of said components thereon;

drive means for said conveyor belt;

at least one tank for liquid electrolyte disposed along the path of said conveyor belt, said tank being provided with



weirs in its upper edge adapted to pass the conveyor belt and components engaged thereon inwardly and outwardly of the liquid mass contained in said tank; and

electroplating current supply means, including at least one electrode disposed within the liquid volume of said container and at least one current transfer brush in contact with said conveyor belt, for supplying plating current for the deposition of a metallic substance from said electrolyte onto said contact elements.

4,508,612

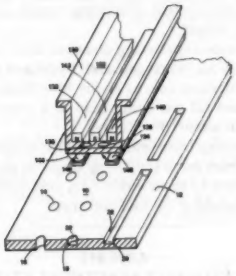
SHIELD FOR IMPROVED MAGNETRON SPUTTER DEPOSITION INTO SURFACE RECESSES

Kim J. Blackwell, Owego; Russell T. White, Jr., Binghamton, and James W. Wilson, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1984, Ser. No. 587,098

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **18 Claims**



1. A system for vacuum depositing a material onto a sample having a surface recess therein comprising:

(a) a vacuum chamber capable of attaining a high vacuum;

(b) a vacuum deposition source disposed in said vacuum chamber for emitting atoms;

(c) an energy source operatively connected to said vacuum deposition source to initiate emission of said atoms therefrom;

(d) a sample having an upper surface disposed in said vacuum chamber opposite said vacuum deposition source for receiving said atoms emitted therefrom, said sample having a surface recess therein with a wall substantially perpendicular to the plane of said sample; and

(e) means for eliminating undesirable depositing angles of said atoms, said means disposed intermediate said vacuum deposition source and said sample to improve the ratio of wall to surface deposition.

4,508,613

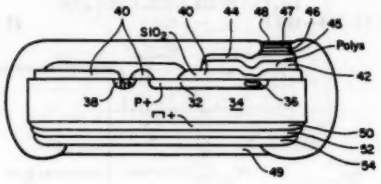
MINIATURIZED POTASSIUM ION SENSOR

Heinz H. Busta, Park Ridge; Kuey-Yeou Tsao, Barrington, both of Ill.; Wayne D. White, Vista, Calif., and Peter V. Loeppert, Hoffman Estates, Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 19, 1983, Ser. No. 562,642

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—418 **8 Claims**



1. A chemically sensitive device for monitoring chemical properties, comprising:

a semiconductor substrate formed from material being slightly doped toward a first polarity;

a depletion-mode field-effect transistor on said substrate, said field-effect transistor having source and drain regions oppositely doped with respect to said substrate with a lightly doped gate region thereinbetween also oppositely doped with respect to said substrate;

a first highly doped region on said substrate of the same polarity of said substrate in electrical contact with said source of said field-effect transistor;

a reference electrode having a reference membrane on said substrate, said reference electrode providing a first potential to said source through said first highly doped region;

a chemically sensitive electrode having a chemically sensitive membrane on said substrate, said chemically sensitive membrane having an increased sensitivity to said chemical property to be monitored relative to said reference membrane, said chemically sensitive electrode being electrically connected to said gate to provide a chemically dependent potential to said gate; and

means for monitoring the current between said source and said drain.

4,508,614

VISBREAKER PERFORMANCE FOR PRODUCTION OF HEATING OIL

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

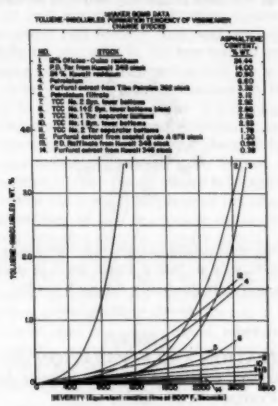
Continuation of Ser. No. 439,662, Nov. 8, 1982, abandoned. This application May 29, 1984, Ser. No. 614,711

Int. Cl.³ C10G *9/14, 53/16*

U.S. Cl. 208—78 **5 Claims**

1. A process for increasing the conversion of heavy oil to stable heating oil by improving visbreaker performance in steps which comprise (1) selecting at least two heavy oil feedstocks from the group consisting of atmospheric residuum, vacuum residuum, furfural-extract, propane-deasphalted tar and catalytic cracker bottoms, wherein at least 75 weight percent of the constituents of each feedstock have a boiling point above about 700° F.; (2) visbreaking each heavy oil feedstock individually at the highest Severity that yields not more than about 0.5 weight percent toluene-insolubles formation as determined by Shaker Bomb test, wherein the highest Severity for at least two of the heavy oil feedstocks differ

relatively by more than about 100 seconds, as expressed in equivalent reaction time at 800° F.; and (3) recovering the



individual visbroken effluents and blending them to provide a product comprising heating oil.

4,508,615

MULTI-STAGE PROCESS FOR DEMETALATION, DESULFURIZATION AND DEWAXING OF PETROLEUM OILS

Stephen M. Oleck, Moorestown, and Robert C. Wilson, Jr., Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 16, 1984, Ser. No. 580,578
Int. Cl.³ C10G *65/02, 45/64*
U.S. Cl. 208—89 **12 Claims**

1. A multi-stage process for demetalation, desulfurization and dewaxing of residual oil which comprises:

(1) contacting a residual oil under demetalation and desulfurization reaction conditions at a temperature of about 500° to about 1000° F., and a pressure of about 300 to about 3000 psig, with a catalyst comprising about 1 to about 10 weight percent of an iron group metal and about 5 to about 25 weight percent of a Group VIB metal, said metals based on the total catalyst, and being present as the oxides or sulfides, on a support comprising at least 85 weight percent alumina, said catalyst having at least 65 percent of its pore volume in the 150 to 300 Angstroms diameter range or at least 60 percent of its pore volume in the 100–200 Angstroms diameter range,

(2) contacting the product of step (1), under desulfurization and dewaxing reaction conditions at a temperature of about 500° to about 1000° F., and a pressure of about 300 to about 3000 psig, with a catalyst comprising about 1 to about 10 weight percent of an iron group metal and about 5 to about 25 weight percent of a Group VIB metal, said metals based on the total catalyst, and being present as the oxides or sulfides on a support comprising a composite of alumina and about 5 to about 25 weight percent of a ZSM-5 crystalline zeolite based on the total composite, said catalyst having at least 60 percent of its pore volume in the 50 to 200 Angstroms diameter range.

4,508,616

HYDROCRACKING WITH TREATED BAUXITE OR LATERITE

José M. Larrauri; Beairit C. Arias, and Roberto E. Galiasso, all of Los Teques, Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Division of Ser. No. 525,624, Aug. 23, 1983, Pat. No. 4,465,784, which is a continuation-in-part of Ser. No. 394,840, Jul. 2, 1982, abandoned. This application May 23, 1984, Ser. No. 613,358
Int. Cl.³ C10G *47/04*
U.S. Cl. 208—111 **2 Claims**

1. A process for the hydrocracking and hydrodemetallization of a heavy hydrocarbon feedstock containing a high level of metals and asphaltenes comprising providing a catalyst prepared from a natural occurring material characterized by an elemental composition comprising aluminum, iron, silicon, magnesium and titanium by the thermal and chemical treatment of said natural occurring material with air and steam at a temperature within 300° to 900° C. and a subsequent treatment with H_2+H_2S at a temperature within 200° to 500° C., said catalyst having the following physical properties:

Surface Area, m^2g	50 to 500
Porous Volume cc/g	0.20 to 0.60
Mean Pore Radius, Å	20 to 200

Porous Volume Distribution:

PV with R 10 Å, %	0 to 100
PV with 10 Å R 100 Å, %	0 to 100
PV with R 100 Å, %	0 to 100

and a surface chemical composition of from about
0.1 to 50 wt.% Al
1 to 50 wt.% Fe
0.1 to 30 wt.% Si
0.1 to 30 wt.% Mg
0.1 to 10 wt.% Ti
3 to 40 wt.% S
and contacting said heavy hydrocarbon feedstock in the presence of hydrogen with said catalyst in a hydrotreatment zone so as to convert said heavy hydrocarbon feedstock into the greatest possible quantity of light hydrocarbons without a significant production of pitch.

4,508,617

DETECTION OF CATALYST BY-PASSING IN FIXED BED NAPHTHA REFORMER

Dean P. Montgomery, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1984, Ser. No. 611,654
Int. Cl.³ C10G *35/04*
U.S. Cl. 208—134 **15 Claims**

1. In a process of endothermic conversion of a naphtha stream by means of a catalytic reforming process, the steps which comprise:

(a) monitoring the effluent stream temperature, monitoring the inlet feed stream temperature, and determining the difference thereof as a negative ΔT; and

(b) periodically reducing the inlet feed stream flow rate and observing again the ΔT, wherein a change of negative ΔT to a positive ΔT indicates by-passing of the catalyst reactor bed.

4,508,618

INCREASING THE OCTANE NUMBER OF NATURAL GASOLINE WITH TRIFLUOROMETHANESULFONIC ACID

George A. Olah, Beverly Hills, Calif., assignor to El Paso Products Company, Odessa, Tex.

Filed Jun. 4, 1984, Ser. No. 616,636
Int. Cl.[3] C10G 35/06; C07C 2/54
U.S. Cl. 208—134 5 Claims

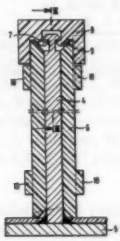
1. A process for upgrading an aromatics-containing natural gasoline of low octane value derived from natural gas which comprises contacting said gasoline containing about 5 wt. % or less aromatics in the absence of added olefin under reaction conditions comprising a temperature in the range between about 100° C. and about 120° C. and a contact time between about 10 minutes and about 4 hours with a catalyst consisting essentially of trifluoromethanesulfonic acid and thereafter recovering an upgraded natural gasoline product of higher octane value.

4,508,619

PROCEDURE FOR PROVIDING THE VANES OF THE STATOR OF A FLOTATION MACHINE WITH A COVER AND FOR FIXING THE COVER

Timo U. Niitti, and Alvar M. Niskala, both of Espoo, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed May 19, 1983, Ser. No. 496,185
Claims priority, application Finland, Jun. 3, 1982, 821977
Int. Cl.[3] B03D 1/14; B23P 11/02
U.S. Cl. 209—169 11 Claims



8. A flotation machine having at least one stator vane, and a cover secured to the vane, said cover being formed by a sleeve cover member of elastic material within which the vane extends, and a locking cap member securing the cover member to the vane, said locking cap member being removable to permit removal of the cover member from the vane.

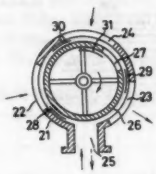
4,508,620

METHOD OF AND APPARATUS FOR FEEDING AND DISCHARGING AIR FOR PNEUMATIC JIGS

Tetsuo Najima; Setsuya Tetsuta; Yukitaka Sawata, and Masahiro Yamagishi, all of Yokohama, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed May 3, 1982, Ser. No. 374,513
Claims priority, application Japan, Nov. 10, 1980, 55-157846; Jan. 12, 1982, 57-2156[U]
Int. Cl.[3] B03B 5/24
U.S. Cl. 209—500 9 Claims

1. A method of feeding and discharging air for pneumatic jigs to separate a pulverulent body in the jig, having the steps of feeding and discharging pressure air to and from air chambers, which are opened at their respective lower ends, and which are formed in water-filled tanks, to vertically vibrate water in the water tanks, and thereby separate the pulverulent body, comprising a plurality of steps of feeding air of different pressure to said air chambers during one cycle of operation, said plurality of feeding steps comprising an initial high pressure feeding step followed by at least one lower pressure feeding step, and a single step of discharging feed air from said air chambers during said one cycle, said air feeding steps being carried out at the same frequency and said air discharging step



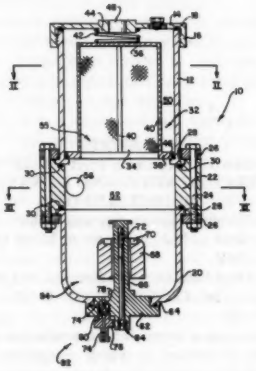
and air feeding steps being carried out repeatedly for a plurality of said one cycle so that a water level in each water tank rises rapidly and falls gradually for each cycle.

4,508,621

FILTRATION AND SEPARATION DEVICE

Henry D. Jackson, 6 Glenora Mews, Andalusia Ave., Somerset W., Cape Province, South Africa

Continuation-in-part of Ser. No. 312,918, Oct. 19, 1981, abandoned. This application Sep. 28, 1983, Ser. No. 536,451
Int. Cl.[3] B01D 35/14
U.S. Cl. 210—86 19 Claims



1. A filtration and separation device for use in separating a foreign liquid and particulate matter contained in a supply liquid, the foreign liquid having a specific gravity greater than that of the supply liquid, wherein said device provides an unobstructed settling chamber which is of maximum volume relative to the overall dimensions of the device, said device comprising:

a generally cylindrical housing having side walls and a top and bottom wall at the respective ends thereof; a cylindrical filter screen member mounted coaxially within said housing, said filter screen member being open at the lower end and having a top wall and foraminous side walls; a mounting means adjacent the lower end of said filter screen member for mounting said filter screen member in a spaced relationship with respect to the walls of said housing, said mounting means providing a fluid tight seal between said housing and said filter screen member adjacent the lower end of said filter screen member; said filter screen member together with said housing defining a settling chamber and an outlet chamber within said housing, said settling chamber extending from the bottom wall of the housing upwardly through the interior of the filter screen member to the top wall thereof, said outlet cham-

ber including the interior portion of the housing located exterior to said filter screen and above said mounting means; means defining an inlet attached in tangential relation to said housing at a location below said filter screen member and leading into said settling chamber; means defining an outlet in the top wall of said housing; said housing being unobstructed across the width of said housing from one wall of the housing to the other in proximity to the horizontal plane of the tangential inlet, said settling chamber being unobstructed across the width thereof upwardly of said horizontal plane of the tangential inlet, means defining a settling zone formed from a substantial portion of the volume of said settling chamber and located below the horizontal plane of the tangential inlet, to permit settling of said particulate matter and said foreign liquid having a specific gravity greater than that of the supply liquid, the larger drops of foreign liquid being allowed to fall directly into the settling zone without being broken up against any internal obstruction.

14. A filtration and separation device for use in separating a foreign liquid contained in a supply liquid, wherein the foreign liquid has a specific gravity greater than that of the supply liquid, said device having a float warnng mechanism for detecting the presence of a predetermined level of said foreign liquid in the lower interior portion of said device, comprising:

a generally cylindrical housing having side walls and a top and bottom wall at the respective ends thereof; said housing having an inlet mounted in tangential relation thereto and an outlet mounted therein and filter means mounted in the flow path between said inlet and outlet; an upwardly extending central column mounted in said bottom wall in coaxial alignment with the vertical axis of said housing; a float member mounted on the exterior of said column, said float member being freely movable in a vertical direction on said column and being freely rotatable about the vertical axis of said column; said float member having a specific gravity which is greater than that of the supply liquid but less than that of the foreign liquid; said float member being provided with a pair of magnets located on opposite sides of the column; and switch means mounted on said column, said switch means being responsive to the magnets so that said switch means closes when the float member is raised to a predetermined level, while said float member is in a rotating or non-rotating condition, said housing being unobstructed across the width of said housing from one wall of the housing to the other in proximity to the horizontal plane of the tangential inlet, means defining a settling zone formed from a substantial portion of the volume of said housing and located below the horizontal plane of the tangential inlet to permit settling of said foreign liquid, said float member being located in said settling zone and out of the flow path between said inlet and outlet.

4,508,622

DIALYSIS APPARATUS WITH REGULATED MIXING OF THE DIALYSIS SOLUTION

Hans-Dietrich Polaschegg, Oberursel, and Dieter Husar, Bad Homburg, both of Fed. Rep. of Germany, assignors to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed Jun. 20, 1983, Ser. No. 506,154

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1982, 3223051

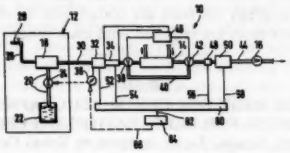
Int. Cl.³ B01D *13/00, 31/00*

U.S. Cl. 210—96.2 **17 Claims**

1. A dialysis apparatus with a unit for the production of a dialysis solution from a concentrate and water, the apparatus having a concentrate tank, a mixing unit, a pump for feeding concentrate from the concentrate tank into the mixing unit and a water connection connected to the mixing unit, the apparatus having a dialyzer for producing a treated liquid, said dialyzer being connected with said mixing unit, said dialyzer being equipped with two dialyzer chambers separated by a membrane, the first dialyzer chamber being adapted to be filled with blood, the apparatus further having pumps to route blood and untreated dialysis liquid through the dialyzer, and an ultrafiltration device to produced ultrafiltrate for withdrawal characterized in that:

an evaluation unit is provided at least for observation of a comparison of a representation of electrolyte contents of untreated liquid and treated liquid directed through said dialyzer;

at least one first detector is provided which is connected to receive untreated liquid upstream of said dialyzer and



which is connected with said evaluation unit, said first detector being operative for determining and conveying to said evaluation unit a representation of the electrolyte contents of untreated liquid upstream of said dialyzer; and

at least one second detector is provided which is connected to receive treated liquid downstream of said dialyzer and which is connected with said evaluation unit, said second detector being operative for determining and conveying to said evaluation unit a representation of the electrolyte contents of treated liquid downstream of said dialyzer.

4,508,623

SNAP-TOGETHER FILTER-PLATE ASSEMBLY

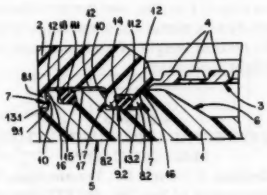
Franz Heckl, Senden, and Herbert Herget, Staig-Steinberg, both of Fed. Rep. of Germany, assignors to Lenser Verwaltungs-GmbH, Senden, Fed. Rep. of Germany

Filed May 31, 1983, Ser. No. 499,378

Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220487

Int. Cl.³ B01D *25/12*

U.S. Cl. 220—229 **11 Claims**



1. A filter-plate assembly for a filter press, the assembly comprising:

a substantially rigid support plate having a plate face formed of a central region and an outer periphery bounding the region;

a substantially rigid annular frame having an annular frame face at least closely confronting the plate face at the periphery;

a generally planar and elastically deformable central filter panel formed integrally with the frame and forming with the central region and within the periphery a pressurizable chamber, whereby pressurization of the chamber can press a filter cloth lying on the filter panel toward another such filter cloth of an adjacent such assembly;

an annular groove formed at the outer periphery in one of the faces, of increasing width away from the one face,

having a flat floor spaced from the other face, and open toward the other face;

an annular ridge formed on and projecting from the other face, having a planar outer end parallel to the one face, and of increasing thickness away from the other face so as to be snap-fittable in the groove; and

respective annular plate and frame seals recessed in the plate and frame and projecting oppositely therefrom at the outer periphery, the plate seal engaging the frame face and the frame seal engaging the plate face, the seals projecting in uncompressed condition from the faces of the plate and frame, whereby the seals are compressed when the plate and frame faces are engaged with each other.

4,508,624

CERAMIC BODY FOR CHROMATOGRAPHY AND PROCESS FOR PREPARATION THEREOF

Koichi Nagata, Sendai, Japan, assignor to Kyoto Ceramic Co., Ltd., Kyoto, Japan

Division of Ser. No. 191,388, Sep. 29, 1980, abandoned. This application Nov. 26, 1982, Ser. No. 445,020

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—658 **4 Claims**

1. A chromatographic process which comprises a sample comprising unknown components in a liquid phase on one end of a solid stationary phase, dipping the end of the solid stationary phase in a developer to separate said unknown components, and analyzing said unknown components, wherein said solid stationary phase is a self-supporting calcined molded porous plate of alumina particles in which the pore size distribution range is from 0.1 to 10μ, and further wherein said plate consists essentially of a mixture of alumina particles containing more than fifty percent weight of α-alumina and less than fifty percent by weight γ-alumina.

4,508,625

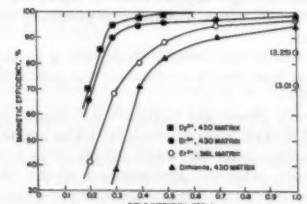
MAGNETIC SEPARATION USING CHELATED MAGNETIC IONS

Marshall D. Graham, 6 Temple St., Framingham, Mass.

Continuation-in-part of Ser. No. 435,015, Oct. 18, 1982, abandoned. This application Oct. 6, 1983, Ser. No. 539,542

Int. Cl.³ B03C *1/00*

U.S. Cl. 210—695 **34 Claims**



1. A process for separating particles having a negative surface charge from a carrier liquid, said process comprising the steps of:

A. contacting said particles with an amount of a chelated paramagnetic metal ion sufficient to develop a magnetic susceptibility associated with the particles greater than the magnetic susceptibility of said carrier liquid; and

B. applying a magnetic field to said particles and carrier liquid to separate at least a portion of said particles from said carrier liquid.

4,508,626

OIL REMOVAL FROM WATER SUSPENSIONS USING IONIC DOMAIN POLYMERS

Everett J. Fuller, Gillette, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 333,129, Dec. 21, 1981, abandoned. This application Jan. 28, 1983, Ser. No. 462,119

Int. Cl.³ C02F *1/54*

U.S. Cl. 210—708 **3 Claims**

1. A process for the purification of water containing emulsified oil particles which consists of the steps of (a) adding a sufficient amount of a neutralized sulfonated polymer to a dispersion of said water containing said emulsified oil particles, to have said neutralized sulfonated polymer interact with said oil particles, said neutralized sulfonated polymer is derived from a polymer selected from the group consisting of Butyl Rubber, EPDM terpolymer, and polystyrene, said neutralized sulfonated polymer having about 5 to about 50 meq. of sulfonate groups per 100 grams of said sulfonated polymer; (b) adding to said dispersion about 0.1 to about 2.0 grams of an aliphatic alcohol per one gram of said neutralized sulfonated polymer, said aliphatic alcohol being selected from the group consisting of n-hexanol and n-heptanol; (c) mixing said sulfonated polymer and said dispersion for a sufficient period of time until the emulsified oil interacts with said neutralized sulfonated polymer, said oil and said neutralized polymer forming a distinct layer from a layer of said water; and (d) mechanical separating said oil and said neutralized sulfonated polymer layer from said water layer.

4,508,627

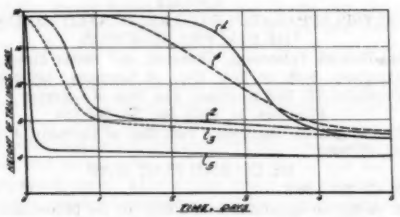
PROCESS FOR MAKING STARCH FLOCCULANTS OF IMPROVED EFFICIENCY

Raymond N. Yong, and Amar J. Sethi, both of Beaconsfield, Canada, assignors to Suncor, Inc., Toronto, Canada

Continuation of Ser. No. 327,850, Dec. 7, 1981, abandoned. This application Sep. 15, 1983, Ser. No. 532,256

Int. Cl.³ C02F *1/54*

U.S. Cl. 210—728 **17 Claims**



1. A process for making an improved starch flocculant wherein an aqueous dispersion is prepared, said dispersion being comprised of starch, lime and alum, containing from about 4 to about 12 gm per 100 ml of water of starch solids concentration, and having alum present in an amount of from about 5% to about 15% of said starch, and said dispersion is heated until the dispersion reaches maximum viscosity, and when the viscosity begins to fall, a phosphate salt is immedi-

ately added in an amount from about 50% to about 100% of the stoichiometric amount based on said lime sufficient to subsequently form a calcium alumino phosphate insoluble salt and hydrolysis is then effected by continued heating to hydrolyze said starch and form said calcium salt, said lime being present in said aqueous dispersion in an amount sufficient to form with said alum and said added metal salt from about 10 to 30 grams of insoluble calcium alumino salt per 100 grams of starch.

10. In the process of flocculating tailing pond water with hydrolyzed starch flocculant, the improvement of using a starch flocculant obtained by the process wherein an aqueous dispersion is prepared, said dispersion being comprised of starch, lime and alum, containing from about 4 to about 12 gm per 100 ml of water of starch solids concentration, and having said alum present in an amount of from about 5% to about 15% of said starch, and said dispersion is heated until the dispersion reaches maximum viscosity, and when the viscosity begins to fall a phosphate salt is immediately added in an amount from about 50% to about 100% of the stoichiometric amount based on said lime sufficient to subsequently form a calcium alumino insoluble salt, and hydrolysis is then effected by continued heating to hydrolyze said starch and form said calcium alumino insoluble salt, said lime being present in said aqueous dispersion in an amount sufficient to form with said alum and said added metal salt from about 10 to 30 grams of insoluble calcium alumino salt per 100 grams of starch.

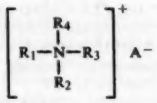
4,508,628

FAST DRILLING INVERT EMULSION DRILLING FLUIDS

Thad O. Walker, Humble; Jay P. Simpson, Houston, and Harry L. Dearing, Sugarland, all of Tex., assignors to O'Brien-Goins-Simpson & Associates, Houston, Tex.

Filed May 19, 1983, Ser. No. 441,418
Int. Cl.³ C09K 7/06
U.S. Cl. 252—8.5 P **8 Claims**

1. A fast drilling invert oil emulsion drilling fluid having enhanced stability at elevated temperatures which comprises oil, water, a water-in-oil emulsifier, a weighting agent, a suspending agent, and a temperature stabilizing additive, wherein said oil is a refined petroleum oil fraction containing primarily straight chain paraffinic hydrocarbons and less than 1% by volume of aromatic hydrocarbons, having a viscosity less than 1.5 centipoises at 25° C., a flash point of at least 60° C., and an aniline point of at least 80° C.; wherein said water contains up to a saturation amount of NaCl or $CaCl_2$; wherein said suspending agent is an organophilic clay which comprises the reaction product of a clay selected from the group consisting of attapulgite, bentonite, hectorite, saponite, and sepiolite, and a quaternary ammonium salt having the structural formula:



wherein R_1, R_2, R_3, and R_4 are independently selected from the group consisting of $C_aH_{2a+1-x}B_x$, $C_bH_{2b-1-x}B_x$, $C_6H_{5-x}B_xCH_2$, and mixtures thereof, $1 \leqq a \leqq 30$, $3 \leqq b \leqq 30$, $0 \leqq x \leqq 2$, B is a radical selected from the group consisting of OH, Cl, Br, C_6H_5, and mixtures thereof, and A is a charge balancing anion, provided that at least one R contains at least 12 carbon atoms, and R_1, R_2, R_3, and R_4 collectively contain at least 20 carbon atoms; and wherein said temperature stabilizing additive contains from 2 to 6 carbon atoms and from 2 to 4 polar groups selected from the group consisting of OH, NH_2, and mixtures thereof, per molecule.

4,508,629

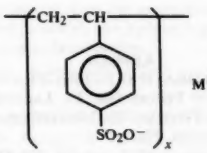
METHOD OF VISCOSIFYING AQUEOUS FLUIDS AND PROCESS FOR RECOVERY OF HYDROCARBONS FROM SUBTERRANEAN FORMATIONS

John K. Borchardt, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

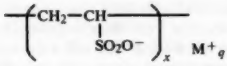
Filed Apr. 8, 1983, Ser. No. 483,356
Int. Cl.³ C09K 7/02; E21B 43/22
U.S. Cl. 252—8.55 D **4 Claims**

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-containing formation penetrated by at least one injection well and at least one production well comprising:

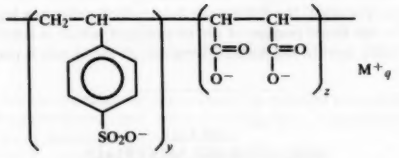
injecting into said formation through said injection well a viscosified aqueous fluid comprising as aqueous fluid having dissolved therein a sufficient quantity of a viscosifying composition to provide a concentration of at least about 300 ppm, said viscosifying composition comprising xanthan gun and at least one member selected from the group consisting of ammonium, hydrogen and alkali metal salts of a polystyrene sulfonate having the formula



a polyvinyl sulfonate having the formula



a hydrolyzed copolymer of styrene sulfonate and maleic anhydride



wherein x has a valve in the range of from about 250 to about 50,000, y has a value of at least about 250, the sum of y+z is in the range of from about 250 to about 50,000 and y comprises at least 30 percent of y+z, M comprises at least one member selected from the group consisting of hydrogen, ammonium and alkali metals and q is an integer equal to the number of cations required to maintain electrical neutrality, the ratio of said xanthan gum to said member selected from the salts of said polystyrene sulfonate, polyvinyl sulfonate, hydrolyzed copolymer of styrene sulfonate and maleic anhydride or a mixture thereof in said viscosifying composition being in the range of from about 1 to 10 to about 15 to 1;

forcing said viscosified aqueous fluid through said formation; and

recovering hydrocarbons from said production well.

4,508,630

OIL SOLUBLE SULFUR FREE OXYMOLYBDENUM ORGANIC COMPOUNDS HAVING FRICTION REDUCING ANTIWEAR PROPERTIES IN LUBRICANT COMPOSITIONS, PROCESS OF MANUFACTURE, AND LUBRICANT COMPOSITIONS

Frederic A. Litt, University Heights, and Thomas R. Czernicki, Euclid, both of Ohio, assignors to The Elco Corporation, Cleveland, Ohio

Continuation of Ser. No. 340,498, Jan. 18, 1982, abandoned. This application Nov. 17, 1983, Ser. No. 552,860

Int. Cl.³ C10M *1/46, 1/54*

U.S. Cl. 252—32.5 17 Claims

1. Hydrocarbon-soluble sulfur free oxymolybdenum compounds represented by the formula

$$[(RO)_n(HO)_{3-n}PO]\ (MoO_3)x$$

where n=1 to 2; x=1.18 to 9 except when n=2, then x=not more than 6, and when n=1.5 then x=not more than 7.5, and R is selected from the group consisting of alkyl, substituted alkyl, aryl, aralkyl, cycloalkyl or alkaryl, including polar substituted embodiments thereof.

4,508,631

DEHYDRATING REFRIGERANT

Joseph J. Packo, 30 Pelican Isle, Ft. Lauderdale, Fla., and Donald L. Bailey, Traverse City, Mich., assignors to Joseph J. Packo, Ft. Lauderdale, Fla.

Filed Aug. 2, 1983, Ser. No. 519,623

The portion of the term of this patent subsequent to Apr. 5, 2000, has been disclaimed.

Int. Cl.³ C09K *5/00*

U.S. Cl. 252—68 14 Claims

1. A moisture removing refrigeration fluid composition for refrigeration and air-conditioning units, comprising:

(a) a material selected from the group consisting of a refrigerant fluid, a lubricating fluid and a mixture thereof; and

(b) a liquid organosilane hydrolyzable dehydrant for removing moisture from the interior of the refrigeration or air-conditioning circuit, said liquid hydrolyzable organosilane or mixture thereof being reactable with moisture to form a liquid, being compatible with said refrigerant fluid both before and after hydrolysis, said organosilane further being one which does not substantially interfere with the properties of the refrigerant fluid, which exists as a liquid in the liquid portion of the circuit, and which is substantially inert to the material from which the circuit is made.

4,508,632

HEAT STORAGE MATERIALS

Takeshi Takeda, Kawasaki; Yasuhiko Machida; Yasuo Kudoh, both of Yokohama, and Kazutoshi Ikegaya, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 15, 1983, Ser. No. 504,601

Claims priority, application Japan, Jun. 15, 1982, 57-103214; Aug. 24, 1982, 57-147110

Int. Cl.³ C09K *5/06*

U.S. Cl. 252—70 5 Claims

1. A heat storage material for use in solar heating systems which consists essentially of a mixture of a sodium salt selected from the group consisting of sodium sulfate decahydrate and sodium thiosulfate pentahydrate, and urea, provided that a mixing ratio by mole of said sodium sulfate decahydrate to said urea is in the range of 1:1 to 1:3 and a mixing ratio by mole of said sodium thiosulfate pentahydrate to said urea is in the range of 1:2 to 1.8.

4,508,633

SCOURING POWDER

Hans-Jurgen Strempel, Rodgau; Manfred Diehl, Frankfurt, and Roland Bergmann, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 8, 1982, Ser. No. 440,166

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144298

Int. Cl.³ C11D *17/06*

U.S. Cl. 252—135 5 Claims

1. A process of scouring comprising scouring with scouring powder containing crystalline zeolite powder of Type A as the sole mechanical cleaning component, said zeolite having the following particle spectrum:

Fractions (μ)	Proportions (Weight %)
<3	<15
<5	<35
<10	<82
<15	<96
<20	up to 100

and at least 99.5% by weight of the particles have a diameter below 45 microns.

4,508,634

AQUEOUS SKIN CLEANER COMPOSITION COMPRISING PROPYLENE CARBONATE

Normita P. Elepaño, St. Paul, Minn.; William H. Schnur, Balsam Lake, Wis., and Jens L. Jorgensen, Ham Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 15, 1983, Ser. No. 551,880

Int. Cl.³ B08B *3/08;* C09D *9/02;* C11D *7/50;* C23G *5/02*

U.S. Cl. 252—163 4 Claims

1. A composition useful for removing paint, primer grease, dirt from the surface of skin comprising:

(a) from about 10% to about 40% by weight propylene carbonate,

(b) from about 10% to about 50% by weight water,

(c) from about 1% to about 30% by weight at least one cosolvent,

(d) from about 0.5% to about 12% by weight at least one surfactant,

(e) from about 0.1% to about 5% by weight at least one thickening agent,

(f) from about 0.01% to about 1% by weight at least one buffering agent, and

(g) from 0% to about 15% by weight at least one abrasive material.

4,508,635

GENERAL-PURPOSE CLEANING COMPOSITION COMPRISING NONIONIC SURFACTANT AND ALCOHOL ESTERIFIED RESIN COPOLYMER

David E. Clarke, Bromborough, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 378,658, May 17, 1982,. This application Feb. 15, 1984, Ser. No. 580,499

Claims priority, application United Kingdom, May 29, 1981, 8116439

Int. Cl.³ C11D *1/66, 15/04*

U.S. Cl. 252—174.23 9 Claims

1. A liquid general-purpose cleaning composition with improved non-streak and cleaning properties, comprising: (a) 0.01–98% by weight of a nonionic surfactant, having an HLB-value of between 10 and 15, (b) 0.005–20% by weight of an at least 5% alcohol esterified resin copolymer formed from an unsaturated monomer and an unsaturated dicarboxylic acid or anhydride, and (c) 1–99.985% of a compatible liquid medium.

4,508,636

RADIATION IMAGE STORAGE PANEL

Takeji Ochiai, Minamiashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Nov. 15, 1982, Ser. No. 441,744
Claims priority, application Japan, Nov. 20, 1981, 56-187501
Int. Cl.³ C09K *11/02*
U.S. Cl. 252—301.36 **3 Claims**

1. A radiation image storage panel comprising a substrate and a fluorescent layer provided on said substrate, said fluorescent layer consisting essentially of a binder and a stimulable phosphor dispersed therein, wherein said binder comprises (a) linear polyester resin, obtained by a polycondensation reaction of dihydroxy compound with dibasic acid or by polyaddition reaction of oxyacid, and (b) nitrocellulose.

4,508,637

MIXTURES OF ALKYL AND ALKENYL SUCCINIC ACIDS AND POLYMER ACIDS

William J. Heintzelman, and Richard L. Godar, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 28, 1980, Ser. No. 125,726
Int. Cl.³ C09K *3/00*; C10L *1/18*; C23F *11/12*
U.S. Cl. 252—396 **6 Claims**

1. A composition comprising
(1) predominately trimer polymer acid, and
(2) an alkenyl or alkyl succinic acid or the anhydride thereof, the weight ratio of (1) to (2) being about 2 to 1 or less.

4,508,638

AGENT AND METHOD FOR THE STABILIZATION OF POLYVINYL CHLORIDE AGAINST HEAT AND LIGHT

Joachim von Seyerl, Seeon, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Mar. 29, 1983, Ser. No. 480,175
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212336
Int. Cl.³ C09K *15/16*
U.S. Cl. 252—401 **5 Claims**

1. An improved agent of the type containing dicyandiamide for stabilizing polyvinyl chloride against degradation by heat and light, wherein the improvement comprises water means to provide 0.5 to 7 equivalents of water based on the dicyandiamide and said water means is a compound capable of reacting with HCl to form water and chloride.

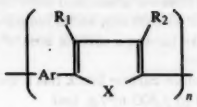
4,508,639

POLYMERS CONTAINING HETEROCYCLES AND AROMATIC NUCLEI, AND CONDUCTIVE ORGANIC MATERIALS MADE FROM SUCH POLYMERS

Marcel Camps, St. Etienne; Alain Douillard, Rives-de-Gier; Jean-Claude Dubois; Maryse Gazard, both of Paris; Jean-Pierre Montheard; Thierry Pascal, both of St. Etienne, and Gérard Seytre, Tassin-la-Demi-Lune, all of France, assignors to Thomson-CSF, Paris, France

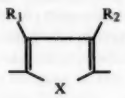
Filed May 23, 1983, Ser. No. 497,234
Claims priority, application France, May 25, 1982, 82 09049
Int. Cl.³ C08G *75/00, 83/00*
U.S. Cl. 252—500 **6 Claims**

1. A polymer material made from two different monomer units, wherein said first monomer unit includes at least one aromatic nucleus and said second monomer unit is a five membered conjugated heterocyclic ring, said polymer material having the following formula:



in which:

Ar represents said first monomer unit, which is chosen from the group consisting of p-phenylene, m-phenylene, biphenylene, anthracene, fluorene and phenanthrene, and wherein



represents said second monomer unit;

wherein X represents the group consisting of sulfur and selenium;

R_1 and R_2 are chosen from the group consisting of hydrogen, and alkyl, alkoxyl, and hydroxyl groups; and

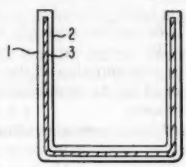
n is the degree of polymerisation.

4,508,640

ELECTROMAGNETIC WAVE-SHIELDING MATERIALS

Masahiro Kanda, Kanagawa; Tetsuya Hatakeyama, Saitama, and Yusuke Morito, Kanagawa, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1982, Ser. No. 444,026
Claims priority, application Japan, Nov. 24, 1981, 56-186825; Dec. 9, 1981, 56-196985; Jan. 7, 1982, 57-602; Apr. 15, 1982, 57-61687; Apr. 15, 1982, 57-61688; Jun. 2, 1982, 57-93002; Sep. 3, 1982, 57-152734; Sep. 14, 1982, 57-158831; Sep. 14, 1982, 57-158832; Nov. 15, 1982, 57-199050
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—503 **12 Claims**



1. An electromagnetic wave-shielding material comprising:
(1) an electromagnetic wave-shielding layer comprised of:
(A) a thermoplastic resin;
(B) an aluminum or aluminum alloy; and
(C) electrically conductive carbon black; and
(2) a surface layer comprised of a thermoplastic resin, wherein:
(a) the thermoplastic resin (A) is selected from the group consisting of:
(i) polyolefins modified with unsaturated carboxylic acids or derivatives of unsaturated carboxylic acids;
(ii) copolymers of ethylene and unsaturated carboxylic acids and/or anhydrides thereof;
(iii) copolymers of ethylene and an alkyl acrylate and/or an alkyl methacrylate;
(iv) styrene-based resins;
(v) vinyl chloride-based resins;
(vi) polyamide resins;
(vii) polycarbonate resins; and
(viii) polyolefins,
(b) the aluminum or aluminum alloy is in the form of: (i)

particles having a mean size of 250 to 20 mesh; (ii) a fiberous aluminum or a fiberous aluminum alloy having a diameter of from 0.002 to 0.05 mm and a length of 10 mm or less; or (iii) a flake having a surface area of from 0.1×0.1 mm to 5×5 mm,

(c) the electrically conductive carbon black has a specific surface area of from 20 to 1,800 m^2/g, and

(d) the proportions of the electrically conductive carbon black and the aluminum or aluminum alloy in the electromagnetic wave-shielding layer are from 5 to 50% by volume, respectively, provided that the total proportion of the carbon black and the aluminum or aluminum alloy is from 10 to 60% by volume, and the difference in solubility parameter between the thermoplastic resin of the surface layer and the thermoplastic resin (A) of the electromagnetic wave-shielding layer is 3.0 or less.

4,508,641

PROCESS FOR THE DECONTAMINATION OF STEEL SURFACES AND DISPOSAL OF RADIOACTIVE WASTE

Jozef Hanulik, Zurich, Switzerland, assignor to Gesellschaft zur Förderung der industrieorientierten, Bern, Switzerland

Filed Aug. 27, 1982, Ser. No. 412,375

Claims priority, application Switzerland, Sep. 1, 1981, 5611/81

Int. Cl.³ G21F *9/28*; C23G *1/08*

U.S. Cl. 252—626 **16 Claims**

1. A process for the decontamination of steel surfaces by removal of the contaminated surface layer with an aqueous decontaminating solution in a recirculation loop and for final treating the used aqueous solution after removal of the surface layer for waste disposal, which process comprises:

(i) in the recirculation loop the steps of:

(a^1) contacting the steel surfaces with an aqueous decontaminating solution comprising at least one acid selected from the group consisting of formic acid and acetic acid, and at least one reducing agent selected from the group consisting of formaldehyde and acetaldehyde, in a concentration to hold dissolved Fe^{2+}-ions stably in the solution;

(b^1) monitoring the concentration of dissolved Fe^{2+}-ions, acid and aldehyde of the decontaminating solution during the dissolution process;

(c^1) treating the used decontaminating solution to precipitate iron values dissolved therein in the form of iron hydroxide or in the form of water-insoluble iron (III) compounds, and separating precipitated iron compounds from the liquid by filtering; and

(d^1) treating the aqueous solution remaining after said precipitation to obtain a regenerated decontaminating solution having the desired content of acid and aldehyde, and recircuate it for a new dissolution cycle; and

(ii) in the final treatment for waste disposal the steps of:

(e^1) treating the used decontaminating solution to precipitate iron values dissolved therein in the form of iron hydroxide or in the form of water-insoluble iron (III)-compounds and separating precipitated iron compounds from the liquid by filtering;

(f^1) decomposing the precipitated iron compounds of steps (c^1) and (e^1) thermally and/or catalytically into iron oxide-containing radioactive materials- and into radioactivity-free gaseous decomposition products, and subjecting the iron oxide to nuclear waste disposal by mixing it with cement; and

(g^1) oxidizing the radioactivity-free solution of step (e^1) with an oxidizing agent and decomposing therein dissolved formate or acetate salts.

4,508,642

METHOD OF OBTAINING GREATER LIFETIME DURATION FROM CHEMILUMINESCENT SYSTEMS

Victor B. World, 92 N. Elmwood Ave., Glenolden, Pa. 19036

Filed Apr. 21, 1983, Ser. No. 487,317

Int. Cl.³ C09K *11/06*

U.S. Cl. 252—700 **12 Claims**

1. A chemiluminescent composition essentially consisting of liquid solution in organic solvent of a bis-ester of oxalic acid, an organic fluorescent compound, hydrogen peroxide, and a catalyst, present in relative proportions to produce chemiluminescent light, and a specific C_{13} alkyl ester selected from the group consisting of ditridecyl phthalate and ditridecyl adipate present in the composition in a quantity ranging from about 0.1% to about 1000% (by volume) of the other ingredients of the chemiluminescent, composition said bis-ester having the formula: in which P represents a phenyl group substituted by (1) at least one carbalkoxy group of the formula

in which R is a lower alkyl group, or a substituted lower alkyl group, where said substituents are selected from the group consisting of fluoro, chloro, trifluoromethyl, lower alkoxy, cyano, lower carbalkoxy, and phenyl; or (2) the phenyl group, P, is substituted by at least two additional substituents selected from the group consisting of fluoro, chloro, bromo, cyano, trifluoromethyl, lower carbalkoxy, nitro, lower alkoxy, lower alkoxymethyl and alkyl.

4,508,643

RAT ANTIBODY TO HCG

Edward G. Calamai, Lexington, and Martha A. Daigle, Brookline, both of Mass., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 8, 1983, Ser. No. 464,953

Int. Cl.³ C07G *7/00*; A61K *39/44, 39/395*

U.S. Cl. 260—112 B **8 Claims**

1. The method of raising anti-hCG antibody of high sensitivity and low cross-reactivity with LH which comprises administering whole hCG or β-subunit thereof to a rat, and harvesting anti-hCG antibody from said rat.

4,508,644

CHROMOGENIC COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Helmut Heber, Marburg; Reinhard Eberle, Lahntal, and Volker Teetz, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Fed. Rep. of Germany

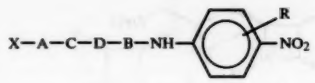
Filed Nov. 25, 1983, Ser. No. 554,942

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3244030

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **5 Claims**

1. A chromogenic compound of the formula I



I

in which

X denotes a hydrogen atom, a protective group customarily used in peptide chemistry or a group which irreversibly blocks the terminal amino group,

A denotes an amino acid, the side-chain group of which can be unsubstituted or substituted, selected from the group consisting of Ala, Cys, Glu, Gln, Gly, His, Ile, Leu, Lys, Phe, Pro, Pyr, Thr, Tyr and Val,

C denotes a bond or an amino acid, the side-chain group of which can be unsubstituted or substituted, selected from the group consisting of Ala, Asp, Glu, Gly, Leu, Lys, Ser and Val,

D denotes an amino acid, the side-chain group of which can be unsubstituted or substituted, selected from the group consisting of Ala, Asp, Glu, Gly, His, Leu, Phe, Pip, Pro, Ser, Thr, Tyr and Val,

B denotes L-arginine, L-homoarginine, L-Lysine, L-homolysine, L-ornithine or L-histidine, and

R denotes $COOR_1$, $CONR_2R_3$, $CONH-(CH_2)_n-N(CH_3)_2$, $CO-Y-OR_1$ and $CO-Y-NR_2R_3$ in the 3-position or OR_1 in the 2-position of the 4-nitroaniline, in which R_1 denotes an aliphatic hydrocarbon radical having 1 to 6 carbon atoms, an aromatic hydrocarbon radical having 6 to 10 carbon atoms, an araliphatic hydrocarbon radical having 7 to 11 carbon atoms or an alicyclic hydrocarbon radical having 3 to 8 carbon atoms,

R_2 denotes a hydrogen atom or a radical defined under R_1,

R_3 denotes an aliphatic hydrocarbon radical having 1 to 10 carbon atoms, an aromatic hydrocarbon radical having 6 to 10 carbon atoms, an araliphatic hydrocarbon radical having 7 to 11 carbon atoms or an alicyclic hydrocarbon radical having 3 to 8 carbon atoms,

Y denotes an alpha-, beta- or gamma-amino acid, the side-chain group of which can be unsubstituted or substituted, selected from the group consisting of Ala, Asn, Asp, β-Ala, γ-But, Cys, Glu, Gly, Ile, Leu, Lys, Met, Arg, Phe, Pro, Ser, Thr, Tyr and Val,

n denotes 1 to 10,

and its acid addition salts.

4,508,645

ANALOGS OF NEUROHYPOPHYSIAL HORMONES WITH INHIBITION EFFECTS

Petr Simek, Prague; Tomislav Barth, Roztoky; Frantisek Brtnik, Prague; Karel Jost, Prague; Alena Machova, Prague; Linda Servítová, Prague, and Jirina Slantinová, Prague, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

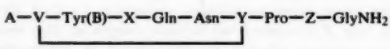
Filed Jun. 3, 1983, Ser. No. 500,773

Claims priority, application Czechoslovakia, Jun. 3, 1982, 4128-82; Aug. 26, 1982, 6206-82

Int. Cl.³ C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 R **10 Claims**

1. Analog of neurohypophysial hormones evidencing inhibition characteristics of the formula:



wherein

(a) A is selected from the group consisting of CH_3CO and H,

(b) V and Y are residues both selected from the group consisting of penicillamine and cysteine, at least one of which is penicillamine,

(c) B is selected from the groups consisting of CH_3 and H,

(d) X is a residue selected from the group consisting of isoleucine and phenylalanine, and

(e) Z is a residue selected from the group consisting of leucine and lysine.

4,508,646

PROCESS FOR THE PREPARATION OF A CATALYST USEFUL FOR ANIONIC LACTAM POLYMERIZATION

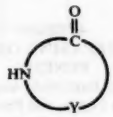
Robert B. Hodek, Gibsonia, and Jerome A. Seiner, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 30, 1984, Ser. No. 575,089

Int. Cl.³ C07D *223/10*

U.S. Cl. 260—239.3 R **9 Claims**

1. In a process for the preparation of a lactam-magnesium compound comprising reacting lactam monomer with an organomagnesium-containing material, the improvement comprises bringing lactam monomer represented by the following structural formula:



wherein Y is an alkylene group having from 3 to 12 carbon atoms, in particulate form, into intimate admixture with the organomagnesium-containing material at a temperature below the melting point of the lactam monomer but at a temperature sufficient to convert at least a portion of the lactam monomer to said lactam-magnesium compound in pulverulent form.

4,508,647

ANTITUMOR ANTIBIOTICS BBM-2040A AND BBM-2040B

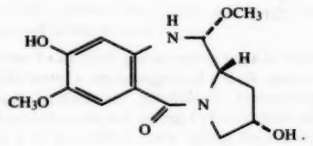
Masami Hatori, Yokosuka; Hiroaki Ohkuma, Tokyo; Masataka Konishi, Kawasaki; Takeo Miyaki, Yokohama, and Hiroshi Kawaguchi, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 401,469, Jul. 26, 1982, Pat. No. 4,464,467. This application May 10, 1984, Ser. No. 608,736

Int. Cl.³ C07D *487/04;* C12P *17/18;* C12N *1/20;* C12R *1/465*

U.S. Cl. 260—239.3 T **2 Claims**

1. The antibiotic BBM-2040A having the formula



4,508,648

PHOSPHORIC ESTER OF ANTIBIOTIC OA-6129

Katsuro Kubo, Fujisawa; Takeo Yoshioka, Ayase; Mitsuyasu Okabe, Fujisawa; Yasuo Fukagawa, Kamakura, and Tomoyuki Ishikura, Chigasaki, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

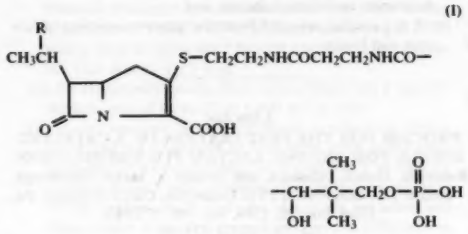
Filed Sep. 24, 1982, Ser. No. 422,378

Claims priority, application Japan, Oct. 2, 1981, 56-156133

Int. Cl.³ C07D *487/04;* A61K *31/40*

U.S. Cl. 260—245.2 T **1 Claim**

1. Compounds presented by the formula



(I)

wherein

R is a hydrogen atom, hydroxyl or hydroxysulfonyloxy, and non-toxic pharmaceutically acceptable salts thereof.

4,508,649

PROCESS FOR PREPARING OPTICALLY ACTIVE PENEMS

Marco Alpegiani; Carlo Battistini; Angelo Bedeschi; Giovanni Franceschi; Maurizio Foglio, and Franco Zarini, all of Milan, Italy, assignors to Farmitalia Carlo Erba, Milano, Italy

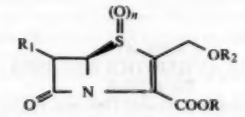
Filed Dec. 6, 1982, Ser. No. 447,187

Claims priority, application United Kingdom, Dec. 11, 1981, 8137513

Int. Cl.[3] **C07D** *499/00;* **A61K** *31/425*

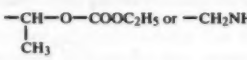
U.S. Cl. 260—245.2 R **2 Claims**

1. A method for preparing a compound of formula



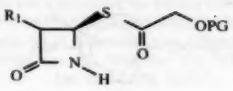
(I)

wherein n is 0 or 1; and wherein R is a hydrogen atom, a lower alkyl, 2,2,2-trichloroethyl, acetonyl, allyl, benzyl, p-nitrobenzyl, p-methoxybenzyl, phenyl, o-nitrophenyl, benzhydryl, 1-phenoxyethyl, acetoxymethyl, pivaloylmethyl or pthalidyl group or a group of the formula:



in which R_3 is an alkyl group having from 1 to 5 carbon atoms or an aryl group; R_1 is a hydrogen atom, a lower alkyl, lower alkoxy, cyclopentyl, cyclohexyl, or hydroxyalkyl group, wherein the hydroxyalkyl group has an unblocked alcohol group or an alcohol group which is blocked by a protective group selected from the group consisting of p-nitrobenzyloxycarbonyl, dimethyl-t-butylsilyl, diphenyl-t-butylsilyl, 2,2,2-trichloroethoxycarbonyl, trimethylsilyl, benzyl, p-bromophenacyl, triphenylmethyl or pyranyl groups; and R_2 is a hydrogen atom, an alkyl group having from 1 to 5 carbon atoms, a carbamoyl or N-C_1–C_4 alkyl substituted carbamoyl group, an alkanoyl group having from 2 to 6 carbon atoms, a C_4–C_7 cycloalkylcarbonyl group or an arylcarbonyl group selected from the group of unsubstituted phenylcarbonyl or phenyl carbonyl having the phenyl group substituted with a halogen, hydroxy, amino, cyano, nitro, lower alkyl or lower alkoxy group; and pharmaceutically acceptable salts thereof, said method consisting of:

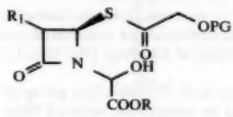
(i) reacting a compound of the formula (V)



(V)

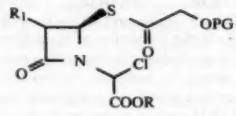
wherein R_1 is as defined above and PG is a protecting group as defined above; with a compound of the formula CHOCOOR, wherein R is as defined above at a temperature of from 70° to 100° C.,

(ii) chlorinating the resultant compound of step (i), having the formula (X):



(X)

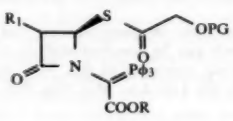
(iii) reacting the resultant compound of step (ii), having the formula (XI):



(XI)

wherein R_1, R and PG are as defined above, with triphenylphosphine at a temperature of from 30° to 60° C., and

(iv) converting the resultant compound of step (iii), having the formula (XII):

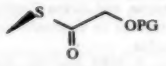


(XII)

with a compound having the formula (I) as defined above, by the following steps (a) to (c):

(a) cyclizing by heating under nitrogen atmosphere at a temperature of from 80° to 150° C. in an inert solvent,

(b) removing the protecting group PG from the substituent of the moiety:

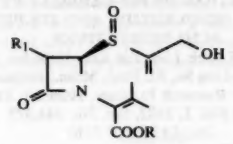


and,

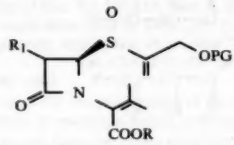
(c) introducing the group R_2, which is as defined above into the resultant moiety of step (b):

wherein step (a) is carried out after step (b) and before step (c), or step (a) is carried out after steps (b) and (c), or step (b) is omitted when R_2 is a hydrogen atom and step (a) is carried out before or after step (c); and

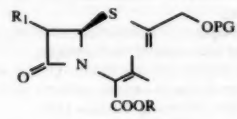
further wherein said compound of the formula (V) in step (i) is prepared by protecting the hydroxy group of a compound having the formula (II)


(II)

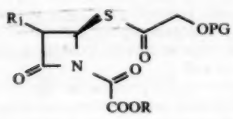
wherein R_1 and R are as defined above, with a protecting group, PG, which is as defined above; reducing the resultant compound having the formula (III)


(III)

wherein R, R_1 and PG are as defined above, with phosphorous tribromide, ozonolyzing the resultant compound having the formula (IV)


(IV)

wherein R, R_1 and PG are as defined above, in a solvent at a temperature of from −80° to −50° C.; and methanolyzing the resultant compound having formula (IVa)


(IVa)

wherein R, R_1 and PG are as defined above, in the presence of silica gel to give a compound having formula V.

4,508,650

PROCESS FOR THE PREPARATION OF HIGH PURITY PHTHALOCYANINE PIGMENTS

Emery G. Tokoli, Rochester; Anthony M. Horgan, Pittsford, and Kathleen M. Carmichael, Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 27, 1983, Ser. No. 517,868
Int. Cl.³ C07D *487/22*; C09B *47/04*
U.S. Cl. 260—245.86 **28 Claims**

1. A process for the preparation of pigments of high purity which comprises reacting in the presence of an organic solvent an appropriate impure pigment with an organic acid of the formula R-X, or comprises reacting an appropriate impure pigment with an organic acid of the formula R-X, and subsequently mixing an organic solvent with the resulting organic mixture, mixing a precipitating agent with the resulting solution mixture, followed by separation of the desired pure pigment from the reaction mixture, wherein R is an alkyl group, containing from about 4 carbon atoms to about 22 carbon atoms, or an aryl group containing from about 6 carbon atoms to about 24 carbon atoms, and X is an anion.

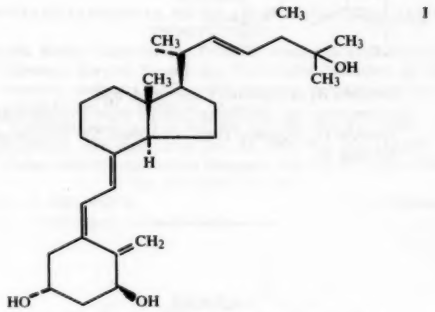
4,508,651

SYNTHESIS OF 1α,25-DIHYDROXYERGOCALCIFEROL

Enrico G. Baggiolini; Andrew D. Batcho, both of North Caldwell; Alfred Boris, Parsippany, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

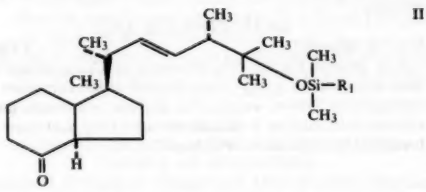
Filed Mar. 21, 1983, Ser. No. 477,059
Int. Cl.³ C07J *9/00*
U.S. Cl. 260—397.2 **3 Claims**

1. A process of the preparation of 1α,25-dihydroxyergocalciferol of the formula

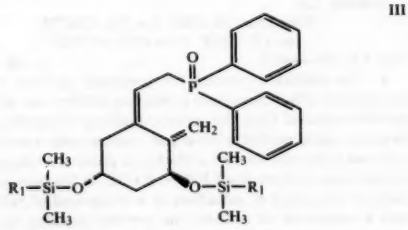

I

which comprises the steps of

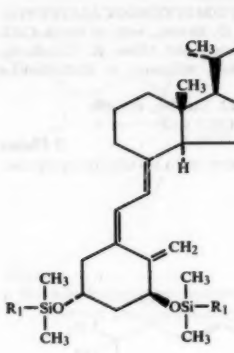
(a) reacting a compound of the formula


II

wherein R_1 is lower alkyl, aryl, or ar-lower alkyl, with a compound of the formula


III

wherein R_1 is as previously described to yield a corresponding compound of the formula



IV

wherein R_1 as previously described, and

(b) removing the protecting groups from a compound of formula IV, whereby there is obtained the compound of formula I.

4,508,652

PROCESS FOR THE TRIMERIZATION OF UNSATURATED FATTY ACIDS

Jacob van Dijk, Maassluis; Johannes W. Renken, Gouda; Jan G. Dekker, Rozenburg, and Johannes Helmond, Gouda, all of Netherlands, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,258

Claims priority, application Netherlands, Jun. 25, 1981, 8103066

Int. Cl.³ C08H *3/00, 5/00*

U.S. Cl. 260—407 **9 Claims**

1. A process for the polymerization of C_{14-22} unsaturated fatty acids and C_{1-4} alkyl esters thereof which comprises dissolving 0.5 to 20% by weight of an aliphatic or aromatic monosulfonic acid catalyst in said unsaturated fatty acid/ester and heating at a temperature of at least 120° C.

4,508,653

METHOD FOR PREPARING ACYLOXY STYRENES

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 14, 1983, Ser. No. 474,775

Int. Cl.³ C07F *5/08;* **C07C** *67/055*

U.S. Cl. 260—410.5 **18 Claims**

1. The oxidation process for preparing acyloxy styrene compounds which comprises contacting at least one substrate member selected from the group consisting of styrene, ethyl, benzene, alpha methyl styrene and cumene with a carboxylic acid and molecular oxygen in the liquid phase at a temperature in the range of from about 100° to 300° C. in the presence of a catalyst composed of palladium or a compound of palladium and a compound of at least one member selected from the group consisting of antimony, lead, cobalt, nickel, iron, copper, zinc, chromium, tin and optionally an alkali metal also compound.

4,508,654

PREPARATION OF BIS-CARBOXY ETHYL GERMANIUM SESQUIOXIDE AND ITS PROPIONIC ACID DERIVATIVES

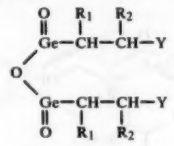
Ching-Te Chang, Taipei; Lian-Tze Lee, Hsinchu, both of Taiwan, and Hsueh-Ling Su, St. Paul, Minn., assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Feb. 1, 1982, Ser. No. 344,377

Int. Cl.³ C07F *7/30*

U.S. Cl. 260—429 R **11 Claims**

1. A method of making a bis organic germanium sesquioxide compound of the following formula: (V):



(V)

where R_1 and R_2 are hydrogen or lower alkyl and Y is COOH, COOR (where R is lower alkyl), $CONH_2$ or CN, comprising in combination the steps of:

(a) reducing germanium dioxide with hypophosphorous acid or its salt in an aqueous medium in the presence of hydrochloric acid in a concentration sufficient to form germanous phosphite;

(b) extracting the aqueous solution formed in step (a) with an organic solvent incompatible with water;

(c) reacting the germanous phosphite in the solution obtained from step (b) in an organic solvent with an acrylic compound of the following formula (III):

(III)

where R_1, R_2 and Y are as previously defined to form organo germanyl chlorophosphite derivatives of (III):

(d) evaporating the organic solvent from the solution resulting from step (c); and

(e) hydrolyzing the organo-germanium derivatives in the product of step (d) with water to form a bis organo germanium sesquioxide compound of said formula (V).

4,508,655

METAL COMPLEXES OF HALOGEN-SUBSTITUTED O-BENZENEDITHIOLS

Katsuyoshi Sasagawa, and Masao Imai, both of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

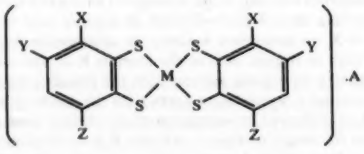
Filed Dec. 9, 1982, Ser. No. 448,331

Claims priority, application Japan, Dec. 16, 1981, 56-201574; Dec. 16, 1981, 56-201575

Int. Cl.³ C07F *15/00, 15/04*

U.S. Cl. 260—429 R **2 Claims**

1. Metal complexes of halogen-substituted o-benzenedithiols of general formula (I):



(I)

wherein X represents a chlorine or bromine atom, Y and Z represent each a hydrogen or chlorine atom when X is a chlo-

rine atom or they represent each a hydrogen or bromine atom when X is a bromine atom, M represents a nickel, palladium or platinum atom, and A represents a quaternary ammonium group selected from the group consisting of tetra-n-butylammonium, tetra-n-propylammonium and trioctylmethylammonium.

4,508,656

PROCESS FGR SYNTHESIZING ALLYL CARBONATES OF POLYHYDRIC ALCOHOLS AND THEIR DERIVATIVES

Ugo Romano, Vimercate, and Giuseppe Iori, San Donato Milanese, both of Italy, assignors to Anic, S.p.A., Palermo, Italy

Continuation of Ser. No. 240,119, Mar. 3, 1981, abandoned. This application May 3, 1982, Ser. No. 374,331

Claims priority, application Italy, Mar. 5, 1980, 20351 A/80

Int. Cl.³ C07C *68/06*

U.S. Cl. 260—463 **8 Claims**

1. A process for the preparation of allyl carbonates consisting essentially of reacting a diallyl carbonate with a polyhydric alcohol selected from the group consisting of ethylene glycol, propylene glycol, diethylene glycol, triethyleneglycol, tetraethylene glycol, butanediol, hexanediol and glycerol, the diallyl carbonate and polyol being present in a molar ratio from about 2:1 to about 20:1, said reaction taking place at a temperature of from about 50° C. to about 150° C. in the presence of an alkaline catalyst selected from the group consisting of sodium hydroxide, sodium carbonate, and organic bases, said alkaline catalyst being present in an amount between 0.01 ppm and 1 percent on a weight basis relative to the polyhydric alcohol.

4,508,657

PEPTIDE SYNTHESIS AND AMINO ACID BLOCKING AGENTS

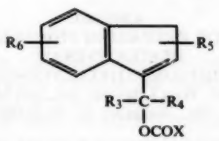
Louis A. Carpino, and Beri Cohen, both of Amherst, Mass., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 342,296, Jan. 19, 1982, Pat. No. 4,394,514. This application Apr. 29, 1983, Ser. No. 490,124

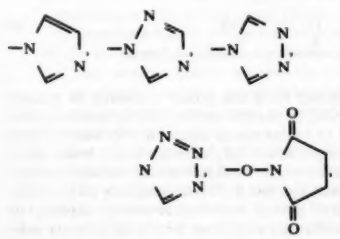
Int. Cl.³ C07D *233/66*

U.S. Cl. 260—463 **9 Claims**

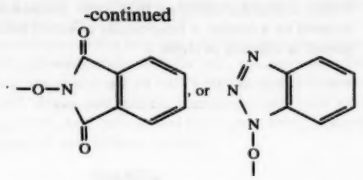
1. A compound of the formula



wherein R_3 and R_4 are each hydrogen, alkyl, aryl or aralkyl; R_5 is up to three hydrogen atoms, alkyl, aryl, alkaryl, aralkyl, halogen or nitro; and R_6 is up to four hydrogen atoms, fused phenyl, alkyl, aryl, alkaryl, aralkyl, halogen or nitro; X is —F,—Cl,—Br,—I,—CN,—SR_7,—SAr,—N_3,—OAr,



-continued



an alkyl, aryl, alkaryl or aralkyl group containing up to nine carbon atoms.

4,508,658

PENTAHALOPHENYL ESTER OF CYANOACETIC ACID DERIVATIVES

Magda Huhn; Gabor Szabo; Peter Dvortsak, all of Budapest; Marianna Karpati, Szeged, and Eva Somfai, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

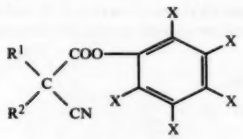
Continuation-in-part of Ser. No. 923,698, Jul. 11, 1978, abandoned. This application Jan. 18, 1980, Ser. No. 113,380

Claims priority, application Hungary, Jul. 13, 1977, CI 1755

Int. Cl.³ C07C *121/46*

U.S. Cl. 260—465 D **9 Claims**

1. A compound of the formula:



wherein

R^1 is hydrogen or C_1 to C_6 alkyl;

R^2 is hydrogen, phenyl, thienyl, furyl, pyridyl, C_1 to C_6 alkyl, furylalkyl where the alkyl is C_1 to C_6, or phenylalkyl where the alkyl is C_1 to C_6; or

R^1 and R^2 together form C_1 to C_4 alkylidene, furyl-C_1 to C_4 alkylidene or phenyl-C_1 to C_4 alkylidene; and X is halo.

4,508,659

2-CYANO-3-BENZYLAMINO-2-FROPENOATES, USEFUL AS FUNGICIDES

Graham P. Rowson, Gt. Chesterford; Albert Percival, Hauxton, and Philip N. Judson, Linton, all of England, assignors to FBC Limited, Hauxton, England

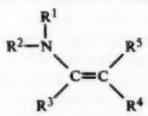
Filed Feb. 28, 1983, Ser. No. 470,679

Claims priority, application United Kingdom, Mar. 5, 1982, 8206480

Int. Cl.³ C07C *121/52*; A61K *31/275*

U.S. Cl. 260—465 D **4 Claims**

1. A compound of formula I



I

in which

R^1 is methyl;

R^2 is benzyl;

R^3 is hydrogen;

R^4 is cyano and

R^5 is C_{3-5} alkoxycarbonyl.

4. A method of controlling or preventing fungal growth

which comprises applying to a locus infested or liable to be infested by a fungus, a fungicidally effective amount of a compound as claimed in claim 1.

4,508,660

CARBONYLATION OF OLEFINICALLY UNSATURATED NITRILES AND ACIDS USING A SULFONE SOLVENT

James B. Sieja, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 14, 1983, Ser. No. 475,029
Int. Cl.³ C07C *121/407, 67/38, 51/14*
U.S. Cl. 260—465.4 **11 Claims**

1. A process for cabonylating compounds of the formula R_1A wherein R_1 is selected from a group consisting of alkenyl groups having 3–8 carbon atoms and A is selected from the groups consisting of C≡N and

and mixtures thereof comprising reacting said compounds at a temperature up to 250° C. with carbon monoxide and a compound having the formula R_2OH wherein R_2 is selected from the groups H and alkyl groups having 1–12 carbon atoms in the pressure of a sulfone solvent having the formula

wherein R_3 and R_4 are the same or different and are optionally cojoined and are selected from alkyl groups having 1–8 carbon atoms and when R_3 and R_4 are cojoined aliphatic alkylene groups having 2–4 carbon atoms wherein solvent amounts of a mole ratio of the sulfone to the starting R_1A compound of at least 0.5/1 is employed and said process being carried out in the presence of a cobalt containing carbonylation catalyst.

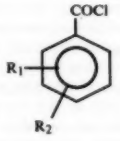
4,508,661

METHOD FOR THE DECOLORIZATION OF AROYL CHLORIDE COMPOSITIONS

Richard H. Chow, Williamsville, and Emil J. Geering, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,237
Int. Cl.³ C07C *51/64*
U.S. Cl. 260—544 D **13 Claims**

1. A method for decolorizing an aroyl chloride of the formula



wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, halogen, alkyl, and alkoxy, which comprises contacting the aroyl chloride with a polyamide.

4,508,662

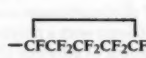
PENTAFLUOROTELLURIUMOXIDE FLUOROCARBONS

Carl J. Schack, Chatsworth, and Karl O. Christe, Calabasas, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 24, 1983, Ser. No. 478,589
Int. Cl.³ C07C *165/00*
U.S. Cl. 260—550 **15 Claims**

1. A high density, TeF_5O— substituted, fluorocarbon fluid having the following structural formula:

wherein R_f is a radical selected from the group consisting of $-CF_2CF_3$; $-CF_2CF_2Cl$; $-CFClCF_3$; $-F_2CF_2CF_3$; $-CF(CF_3)_2$; $-CF_2CFClCF_3$ and



9. A method for synthesizing a pentafluorotellurim oxide fluorocarbon which comprises the steps of:

(A) cooling an evacuated reaction chamber to a subambient temperature;

(B) successively condensing (1) a pentafluorotellurium hypohalite and (2) an ethylenically unsaturated, abphatic or acyclic, straight or branch-chained fluorocarbon having from 2 to 5 carbon atoms into said cooled reaction chamber;

(C) raising the subambient temperature of said reaction chamber to ambient temperature and maintaining said ambient temperature for a period of time, sufficient to effect a reaction between said hypohalite and said fluorocarbon thereby synthesizing a highly dense reaction product;

(D) fractionally condensing said reaction product successively at a series of temperatures sufficient to produce respectively a (1) less volatile fraction and (2) a more volatile fraction; and

(E) collecting said less volatile fraction as a pentafluorotellurium oxide fluorocarbon reaction product.

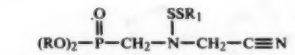
4,508,663

PROCESS FOR PREPARING THIOSULFENAMIDE DERIVATIVES OF N-PHOSPHONOMETHYLGLYCINONITRILES

James A. Sikorski, West Lafayette, Ind., and Mary A. Hoobler, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 309,321, Oct. 5, 1981, Pat. No. 4,407,763.
This application Jul. 18, 1983, Ser. No. 514,403
The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.
Int. Cl.³ C07F *9/32*
U.S. Cl. 260—968 **26 Claims**

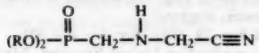
1. A process for preparing a compound of the formula



(I)

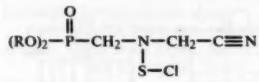
wherein R is selected from the group consisting of phenyl, naphthyl, biphenylyl; or phenyl, naphthyl or biphenylyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, lower alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen; and R_1 is independently alkyl, cycloalkyl, aralower alkyl, phenyl, naphthyl, or phenyl, naphthyl or aralower alkyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl,

lower alkoxy, halogen, and trifluoromethyl which comprises reacting a compound of the formula



(II)

wherein R is as aforedefined with sulfur dichloride in the presence of a hydrogen chloride acceptor to form a compound of the formula



(III)

wherein R is as above defined, and reacting said compound of formula (III) with a compound of the formula

R_1SH (IV)

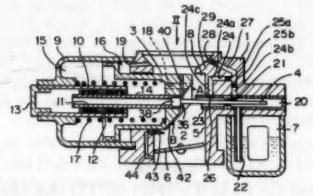
to form said compound of formula (I) wherein R_1 is as aforedefined in the presence of a hydrogen chloride acceptor.

4,508,664

VARIABLE VENTURI-TYPE CARBURETOR

Yoshio Tamura; Takaaki Ito, both of Mishima, and Toshiharu Morino, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisan Industry Co., Ltd., both of, Japan

Filed Oct. 24, 1983, Ser. No. 544,988
Claims priority, application Japan, Mar. 23, 1983, 58-047296
Int. Cl.³ F02M 9/06
U.S. Cl. 261—44 C **7 Claims**



1. A variable venturi-type carburetor comprising:

(a) a substantially vertically and axially extending intake passage formed in said carburetor;

(b) a suction piston substantially horizontally movable in said intake passage in response to a change in the amount of air flowing within said intake passage, said suction piston having a tip face which defines a venturi in said intake passage;

(c) a fuel passage extending substantially horizontally in said carburetor and being open to said intake passage, said fuel passage having a metering jet therein;

(d) a needle extending through said fuel passage and said metering jet and having a root portion which is fixed onto a central portion of the tip face of said suction piston;

(e) the tip face of said suction piston including

(1) an annular groove around the root portion of said needle, said annular groove being defined by a generally planar bottom surface and a circumferential wall spaced from said root; and

(2) a narrow passage extending in the axial direction of said intake passage from an upstream inlet communicating with said annular groove to a downstream outlet at the downstream end of said tip face, the upstream inlet of said narrow passage being defined by a base surface and opposed side walls, said base surface smoothly merging with the bottom surface of said annular groove; and

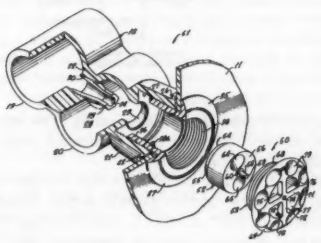
(f) an air-introduction bore into said suction piston having an inlet port communicating with the inlet passage upstream of said suction piston and an outlet port in said circumferential wall above said needle communicating with said annular groove, said bore at said outlet port being tangent to the plane of said bottom surface.

4,508,665

RETROFIT PULSATOR APPARATUS AND METHOD FOR AN AIR/WATER MIXER OF A SWIMMING POOL, THERAPY TUB, SPA OR THE LIKE

Raymond G. Spinnett, Santa Ana, Calif., assignor to KDI American Products, Inc., North Hollywood, Calif.

Filed Jun. 20, 1983, Ser. No. 505,803
Int. Cl.³ B01F 3/04
U.S. Cl. 261—93 **4 Claims**



1. For use with a swimming pool, therapy tub, spa or the like having a wall confining a body of water, a pulsating air/water mixer for projecting an air/water mixture through said wall into said body of water below its surface, said pulsating mixer comprising:

(a) a mixer body having:

(1) an air/water mixing chamber,

(2) an air/water mixture outlet passage communicating with said mixing chamber and opening outwardly through said mixer body,

(3) water input means for projecting an increased velocity water stream through said mixing chamber, whereby air in said chamber is mixed with said water stream to form an air/water mixture stream, and whereby said air/water mixture stream is projected outwardly through said mixture outlet passage, and

(4) an input means for flowing air into said mixing chamber for mixture with said water stream; and

(b) means for repetitively and intermittently blocking said projected air/water mixture stream to cause a pulsation therein, said blocking means comprising a cross bar fixed to and extending across an outer end of said mixture passage, at a portion adapted to be immersed in said body of water, and a rotor journalled in said cross bar, said rotor having an offset dog-leg passage therethrough for flowing said air/water mixture stream toward said cross bar and for rotating said rotor, said dog-leg passage having an upstream end that circumscribes the axis of said rotor.

4,508,666

PROCESS FOR COOLING AND COMMINUTING MOLTEN CALCIUM CARBIDE

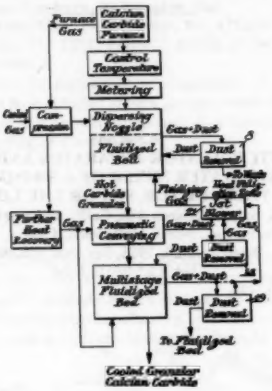
Wilhelm F. Pietzarka; Albrecht Malten, both of Dortmund, and Georg Strauss, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 262,338, May 11, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 478,893

Claims priority, application Fed. Rep. of Germany, May 17, 1980, 3018921

Int. Cl.[3] B29C *23/00*

U.S. Cl. 264—12 4 Claims



1. A process for cooling and comminuting of molten calcium carbide to recover relatively cool particulate solid calcium carbide, said process comprising:

(a) tapping off from a calcium carbide furnace a molten stream of molten calcium carbide, which stream is at a temperature of 1900° to 2100° C., and directing the molten stream to a dispersing zone, the dispersing zone including a dispersing nozzle; said calcium carbide furnace being a furnace which produces a furnace gas substantially inert toward calcium carbide;

(b) compressing the furnace gas produced by the calcium carbide furnace to obtain a pressurized flow of furnace gas, and utilizing pressurized flowing furnace gas in subsequent steps of the process;

(c) dispersing the molten stream in the dispersing zone with the air of the nozzle and pressurized flowing furnace gas, thereby comminuting the molten stream to form droplets of molten calcium carbide;

(d) cooling and solidifying the droplets of calcium carbide to a temperature of about 500° to 600° C. in a first fluidized bed cooling zone comprising the comminuted calcium carbide fluidized by said pressurized flowing furnace gas;

(e) with the aid of pressurized flowing furnace gas, conveying the thus-solified calcium carbide in the form of solid particles to a second fluidized bed cooling zone comprising particles of calcium carbide fluidized by pressurized flowing furnace gas and cooling the particles of calcium carbide to below 200° C. during a calcium carbide particle residence time of less than one hour in the first and second cooling zones;

(f) conveying the further-cooled calcium carbide particles from the second cooling zone at the end of said residence time and recovering cooled calcium carbide particles, said particles being in the form of granules; and (g) recycling at least a portion of the pressurized flowing furnace gas flowing from the fluidized beds for reuse in the process.

4,508,667

MANUFACTURE OF HIGHLY POROUS REFRACTORY MATERIAL

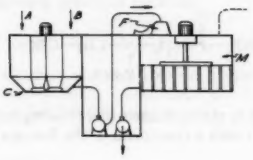
Alwyn Elliott, Tollesbury, England, assignor to Moler Products Limited, Colchester, England

Filed Sep. 29, 1982, Ser. No. 426,901

Claims priority, application United Kingdom, Mar. 2, 1982, 8206054

Int. Cl.[3] B01J *2/02*

U.S. Cl. 264—13 6 Claims



1. A method of making a highly porous refractory material, the method including the steps of making a slurry of the raw material of argillaceous or, feeding the slurry into a spray drier to produce particles having a desired particle size range, subsequently feeding the particles into the hot zone of a furnace chamber and into contact with a gaseous medium therein which gaseous medium is discharged from said furnace chamber as flue gas, and subjecting the particles and the gaseous medium to a violent movement within the furnace chamber to cause said particles to impinge one against another and against surfaces in the hot zone of the furnace chamber, the burning of the gaseous medium producing a temperature high enough to bring the moving particles to a pyro-plastic condition to cause said impinging particles to adhere indiscriminately to one another and to surfaces of the furnace chamber to form agglomerate masses thereon, until such masses become large enough to overcome their adherence to said surfaces and fall into a cooler zone from where they are removed in burned and hardened condition, said desired particle size range being such that the loss of material due to entrainment is the flue gas in approximately 10 percent or less.

4,508,668

METHOD OF FABRICATION OF PIEZOELECTRIC POLYMER TRANSDUCERS BY FORGING

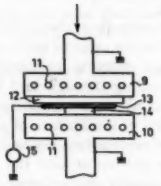
Dominique Broussoux; Hugues Facoetti, and Francois Micheron, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 18, 1983, Ser. No. 467,887

Claims priority, application France, Feb. 22, 1982, 82 02876

Int. Cl.[3] B29D *7/24;* H01G *7/02*

U.S. Cl. 264—22 10 Claims



1. A method of fabrication of a wafer of piezoelectric polymeric material which has uniform piezoelectric properties with respect to one axis when they are measured with respect to said axis, said wafer being obtained from at least one preform by increasing its transverse dimensions and by electric polarization by means of a field directed at right angles to its faces, wherein the elongation results from compression of said pre-

form between two pressure plates having rigid faces continuously contacting said film during compressing, so that the distance between the ends of said film is increased, the variations in relative spacing of the plates being the same at an equal distance from an axis of compression.

4,508,669

PROCESS AND APPARATUS FOR PRODUCING THERMOPLASTIC RESIN FOAM

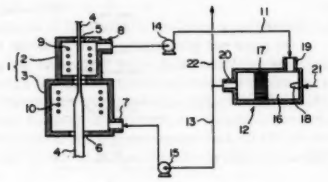
Noboru Iwai, Osaka; Masanori Hirunuma, Kazo, and Junichi Kaneko, Hasuda, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 25, 1984, Ser. No. 604,316

Claims priority, application Japan, Apr. 27, 1983, 58-75393

Int. Cl.³ B29H *5/06*

U.S. Cl. 264—36 **6 Claims**



1. In a process for producing a thermoplastic resin foam which comprises continuously heat-foaming a foamable thermoplastic resin sheet containing a heat-decomposable organic blowing agent with a heated gas, the improvement wherein a gas containing sublimation products generated by the heat-foaming of the foamable sheet is burned to decompose the sublimation products and obtain a treated gas having a substantially reduced content of the sublimation products, and the treated gas is then used as the heated gas for the heat-foaming of the foamable sheet.

4,508,670

METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE IN THERMOFORMING MACHINES

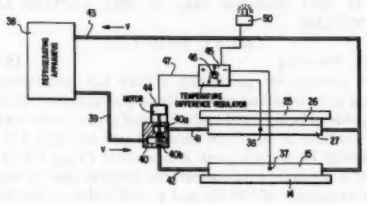
Jürgen Janke, Heilbronn, Fed. Rep. of Germany, assignor to Adolf Illig Maschinenbau GmbH & Co., Heilbronn, Fed. Rep. of Germany

Filed Jul. 27, 1982, Ser. No. 402,342

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135206

Int. Cl.³ B29C *17/03, 17/04*

U.S. Cl. 264—40.6 **5 Claims**



1. A method of controlling the temperature of upper and lower parts of a forming tool making deep-drawn thermoplastic articles, comprising the following steps:

(a) passing a coolant of predetermined total volume through the upper part and the lower part of the forming tool;

(b) measuring the temperature of said upper and lower parts;

(c) determining the actual temperature difference between said upper and lower parts;

(d) comparing the actual temperature difference with a predetermined desired temperature difference;

(e) generating a signal representing the magnitude of deviation between said actual and desired temperature differences; and

(f) applying said signal to a distributor valve connected to conduits passing through said upper and lower parts, thereby increasing the volume of coolant passing through one of said upper and lower parts and decreasing the volume of coolant passing through the other of said upper and lower parts for reducing said magnitude of deviation while maintaining said total volume unchanged; and further comprising the steps of applying the temperatures measured in step (b) to, and setting said desired temperature difference in, a temperature difference regulator; said steps (c), (d) and (e) being performed in said temperature difference regulator.

3. An apparatus for controlling the temperature of an upper and a lower part of a forming tool making deep-drawn thermoplastic articles, comprising

(a) a first conduit means passing through said upper part of said forming tool for introducing coolant into and withdrawing coolant from said upper part;

(b) a second conduit means passing through said lower part of said forming tool for introducing coolant into and withdrawing coolant from said lower part;

(c) a distributor valve having a first coolant port, a second coolant port coupled to said first conduit means and a third coolant port coupled to said second conduit mant port, a second coolant port coupled to said first conduit means and a third coolant port coupled to said second conduit means, a movable distributing means for increasing the quantity of coolant delivered through one of the second and third coolant ports and simultaneously decreasing the quantity of coolant delivered through the other of the second and third coolant ports while maintaining the sum of the quantity of coolant flowing through said first and second conduit means and the respective second and third coolant ports of said distributor valve unchanged;

(d) first and second temperature sensors responding to the temperature of said upper and lower parts, respectively, and emitting first and second signals representing, respectively, the temperature of said upper and lower parts; and

(e) a temperature difference regulator operatively connected to said first and second temperature sensors for receiving said first and second signals for determining the actual temperature difference between said upper and lower parts, for comparing the actual temperature difference with a desired temperature difference and for generating a third signal representing the magnitude of deviation between the actual and desired temperature differences; said temperature difference regulator being further operatively connected to said distributor valve for applying said third signal to said distributor valve for varying the position of said movable distributing means to reduce said magnitude of deviation.

4,508,671

METHOD OF MAKING AN ANISOTROPIC SILICON NITRIDE COMPRISING OBJECT BY USE OF HIGHER DENSITY AND FULLY REACTED PREFORMS

Andre Ezis, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01113, § 371 Date Jul. 19, 1983, § 102(e) Date Jul. 19, 1983

PCT Filed Jul. 19, 1983, Ser. No. 525,498

Int. Cl.³ C04B *35/58*

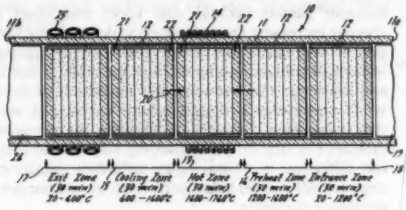
U.S. Cl. 264—58 **13 Claims**

1. A method of densifying a silicon nitride comprising com-

pact having 5–17% by weight yttrium silicon oxynitride and having a density of 2.0–2.6 gm/cm^3, comprising the steps of:

(a) partially sintering said compact at a temperature of 3000°–3200° F. for a period of 0.5–72 hours to form a semidense body with a density of 2.9–3.15 gm/cm^3; and

(b) sequentially hot pressing a stacked assembly of said



bodies by sliding said bodies through the hot zone of a hot pressing cavity during hot pressing cycle at a temperature and pressure to form fully dense anistropic products, each body being separated from the other within the assembly during such sliding by a distance no greater than 0.030 inch, said stacked assembly occupying substantially the entire length of the hot zone of said hot pressing cavity.

4,508,672

CONTINUOUS DRY-SPINNING PROCESS FOR HIGHLY SHRINKABLE ACRYLONITRILE FILAMENTS AND FIBERS

Ulrich Reinehr; Toni Herbertz, and Hermann-Josef Jungverdorben, all of Dormagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,542

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225268

Int. Cl.^{3} D01D *5/22*; D01F *6/18*

U.S. Cl. 264—78 **8 Claims**

1. A process for preparing a highly shrinkable filament or fiber made of an acrylonitrile copolymer containing at least 40% by weight of acrylonitrile units which consists essentially of:

(A) continuously dry-spinning a spinning solution of an acrylonitrile copolymer containing at least 40% by weight of acrylonitrile units which spinning solution has a viscosity at 100° C. of 10 to 60 falling-ball seconds;

(B) continuously evaporating solvent in the spinning cell through which said spinning solution passes in such a way that on leaving the spinning cell the solvent content of the resultant filaments is at most 10% by weight, relative to the solids content of the fiber or filament;

(C) continuously applying to fiber or filament as spun a lubricant and an anti-static composition while maintaining the moisture content of the filaments or fibers at at most 10% by weight, relative to the solids content of the fiber or filament;

(D) continuously stretching the resultant fibers or filaments at a stretching temperature of 65 to 100° C. at a stretching ratio of at most 1:3.5 while insuring that before or during the stretching the filaments have no contact with any other extraction liquid for the spinning solvent; and

(E) continuously crimping the resultant so stretched filaments.

4,508,673

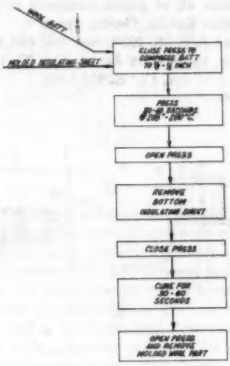
MOLDING OF GLASS WOOL WITH WRINKLE-FREE SURFACE

Steven B. Stahl, Granville; Shiv K. Bakhshi, Columbus, and George M. Naul, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 432,575, Oct. 4, 1982, abandoned. This application May 4, 1984, Ser. No. 606,859

Int. Cl.^{3} B29G *1/00*

U.S. Cl. 264—120 **8 Claims**



1. A process of molding a wool batt comprising mineral or glass wool with uncured thermosettable binder to produce a molded mineral or glass wool part with a wrinkle-free surface, said process comprising subjecting the wool batt to an initial molding step between heated molds after moistening the surface which is to be wrinkle-free, said initial molding step being carried out with an insulating sheet on the side of the wool batt opposite the moistened surface and resulting in a partially cured wrinkle-free skin at the surface which was moistened, and subjecting the wool batt to a second molding step between heated molds without the insulating sheet to cure the wool batt throughout its thickness.

4,508,674

PROCESS FOR THE PRODUCTION OF A POLYESTER FIBER DYEABLE UNDER NORMAL PRESSURE

Tomio Kuriki, Katano, and Seiichi Manabe, Ibaraki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 363,628, Mar. 30, 1982, Pat. No. 4,426,516. This application Sep. 16, 1983, Ser. No. 519,393

Claims priority, application Japan, Mar. 31, 1981, 56-46407; Mar. 31, 1981, 56-46408; May 14, 1981, 56-71358; May 14, 1981, 56-71360

Int. Cl.^{3} D01D *5/12*

U.S. Cl. 264—234 **15 Claims**

1. A process for producing a fiber not undergoing false twisting and consisting essentially of polyethylene terephthalate capable of being dyed under normal pressure and having an initial modulus at 30° C. of about 55 g/d to about 130 g/d, a relationship between a peak temperature (T_{max} (°C.)) at the peak of a dynamic mechanical loss tangent (tan δ) measured with a frequency of 110 Hz and a peak value of the dynamic mechanical loss tangent ((tan $\delta)_{max}$) represented by the formula:

$$(\tan \delta)_{max} \geqq 1 \times 10^{-2}(T_{max} - 105)$$

and a (tan $\delta)_{max}$ of about 0.14 to about 0.30, a dynamic mechanical loss tangent at 220° C. (tan δ_{220}) of at most about 0.055, and a T_{max} (°C.) of at most about 105° C., which comprises subject-

ing a polyethylene terephthalate fiber obtained at a spinning speed of at least about 4000 m/min. to heat treatment at a temperature ranging from a temperature at which a dynamic modulus (E') of the fiber deviates from a tangent line at 180° C. of a logarithm of the E' of the fiber-temperature curve (T_{min}) plus 10° C. to a temperature of completion of melting (T_{m3}) at a melting curve of the fiber measured by a differential scanning calorimeter (DSC) plus 10° C.

4,508,675

NYLON COMPOSITION FOR USE IN ROTATIONAL MOLDING

Peter P. Salatiello, Morris Plains; Frank Petrucelli, Boonton, and Paul W. Flood, Lake Hopatcong, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 256,887, Apr. 24, 1981, abandoned. This application Feb. 8, 1983, Ser. No. 464,836

Int. Cl.³ B29C *5/04*

U.S. Cl. 264—310 **14 Claims**

1. A method of rotationally molding a polyamide article in a rotational molding mold comprising the steps of:

feeding an unwashed polyepsiloncaprolactam composition to the cavity of the rotational mold, wherein the composition comprises polyepsiloncaprolactam, from about 0.001 percent to about 0.5 percent, by weight of the polyepsiloncaprolactam, of a copper compound, and from about 0.001 percent to about 0.3 percent by weight potassium iodide; and

rotationally molding the polyepsiloncaprolactam composition.

4,508,676

CORE STABILIZATION BY SEQUENTIAL INJECTIONS

Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif. 92067

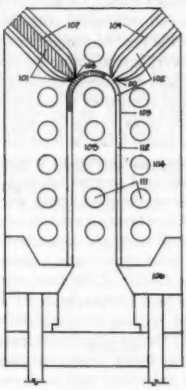
Continuation-in-part of Ser. No. 230,302, Jan. 30, 1981, Pat. No. 4,381,275. This application Mar. 4, 1983, Ser. No. 472,125

Claims priority, application United Kingdom, Jul. 29, 1982, 8221909

The portion of the term of this patent subsequent to Apr. 26, 2000, has been disclaimed.

Int. Cl.³ B29F *1/00*

U.S. Cl. 264—328.8 **25 Claims**



1. A method for controlling the dimensions of a hollow plastics product injection molded within the cooling cavity of a mold having a core section and a cavity section defining the cooling cavity therebetween and separated by a parting line comprising stabilizing the core section in the cooling cavity and being characterized by the steps of:

(a) injecting a first plastics material into the cooling cavity so that only a part of the cooling cavity is filled and so that the injected first plastics material does not completely cover the parting line;

(b) cooling the injected first plastics material in the cooling cavity;

(c) injecting subsequent to injecting the first plastics material a second plastics material into the cooling cavity so that the cooled injected first plastics material in said part of the cooling cavity stabilizes the core section by impeding movement of the core section caused by injecting the second plastics material and whereby the injected second plastics material fills the cooling cavity to thereby completely cover the parting line and fuses with the cooled previously injected plastics material;

(d) cooling the injected plastics material in the cooling cavity to thereby solidify the fused unit; and

(e) ejecting the solidified molded unit.

4,508,677

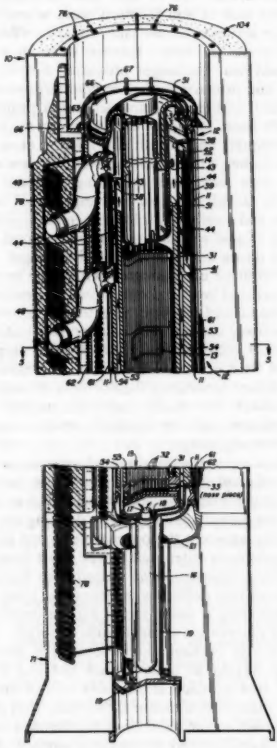
MODULAR NUCLEAR REACTOR FOR A LAND-BASED POWER PLANT AND METHOD FOR THE FABRICATION, INSTALLATION AND OPERATION THEREOF

Edwin R. Craig, and Ben Blumberg, Jr., both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 9, 1983, Ser. No. 465,309

Int. Cl.³ G21C *1/32, 13/02*

U.S. Cl. 376—174 **19 Claims**



1. A transportable prefabricated fast-breeder nuclear heat supply module for shipment to and erection at an electric-power generating facility comprising:

a primary vessel having a removable recessed head including a cylindrical wall;

an outer vessel surrounding said primary vessel and close-coupled thereto to define an interstitial region therebetween, said outer vessel having a removable head and having dimensions sized for shipment on a railroad car;

a fast-breeder reactor core unit mounted within said primary vessel, said reactor core unit including a plurality of control rods;

a heat exchanger of cylindrical annular shape mounted within said primary vessel and having an outer cylindrical wall in common with said primary vessel, said heat exchanger having an inlet and an outlet for secondary coolant;

inlet means and outlet means communicating through said outer and primary vessels with said heat-exchanger inlet and outlet, respectively, said inlet means and said outlet means being adapted for connection to a secondary cooling system;

a pump mounted within said primary vessel underneath the reactor core unit for pumping a primary coolant upwardly through said reactor core unit and said heat exchanger;

first means defining an inlet plenum positioned intermediate the pump and the overlying reactor core, said pump and said reactor core unit communicating directly with said intermediate inlet plenum to define a direct upward primary coolant flow path from said pump to said reactor core unit;

second means defining a primary coolant flow path from said reactor core unit to said heat exchanger including an inner cylindrical wall of said heat exchanger and said cylindrical wall of said recessed head, whereby said heat exchanger serves to isolate said primary coolant from said primary vessel to reduce thermal stress in said primary vessel, said heat exchanger providing a downward flow path for said primary coolant in counterflow to a secondary coolant, and third means defining a primary coolant flow path from said heat exchanger to an inlet of said pump mounted underneath the reactor core, said third means including a first shielding member surrounding said reactor core unit and extending upward therefrom thereby to shield said heat exchanger from said reactor core unit, and a second shielding member interiorly lining a portion of said primary vessel, said second means and said third means being devoid of piping; and

a control rod drive unit mounted within the recess defined by said recessed head and operatively connected through the bottom of said recessed head to said control rods;

whereby primary coolant will be contained entirely within said primary vessel and said nuclear heat supply module will be in fluid communication with the balance of said electric-power generating facility only through said secondary coolant inlet means and outlet means.

13. A segmented shell for assembly about a nuclear heat supply module comprising:

a nuclear heat supply module having an outer wall;

a plurality of shell segments adapted to be joined to one another in surrounding relation to said nuclear heat supply module, the joined shell segments defining an inner wall immediately adjacent the outer wall of said nuclear heat supply module, an outer wall spaced apart from said inner wall and an intermediate wall spaced apart from said inner and outer walls to define therebetween an inner interstitial region providing a water jacket and an outer interstitial region for receiving a cementatious material;

a plurality of heat exchange loops secured to said segments, each loop having an inner branch defining a first heat exchange area disposed at the inner wall of the shell segments for placement intimate to the outer wall of said heat supply module and an outer branch defining a second heat exchange area disposed at the outer surface of said segmented shell outer wall;

whereby said segmented shell when assembled about said heat supply module provides a form for the pouring and curing of a biological shield of cementatious material and said heat exchange loops provide an emergency heat removal system.

4,508,678

LIQUID METAL-COOLED NUCLEAR REACTOR

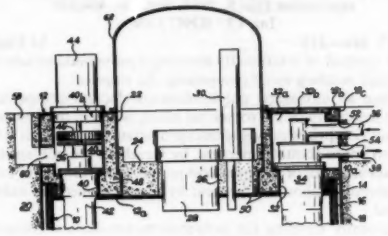
Didier Costes, Meudon, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 7, 1982, Ser. No. 337,746

Claims priority, application France, Jan. 20, 1981, 81 00963

Int. Cl.[3] **G21C** *11/00, 13/06*

U.S. Cl. 376—205 **2 Claims**



1. A liquid metal-cooled nuclear reactor comprising a vessel containing a liquid metal in which the reactor core is to be immersed, said vessel being sealed by a structurally uniform and rigid slab having a thickness greater than the height of the pump structure and heat exchanger structure which are housed in said slab, said slab having a central opening in which is located at least one rotary plug overhanging said reactor core and peripheral openings arranged in the form of a ring around said central opening, at least one pump being suspended in one of said peripheral openings and at least one heat exchanger being suspended in another of said peripheral openings, both of said at least one pump and said at least one heat exchanger being positioned in said liquid metal and wherein at least one of said peripheral openings through which is suspended said heat exchanger comprises a first housing contained within said rigid slab so as to confine the heat exchanger head, said first housing being sealed by a cover located above the heat exchanger head; wherein one of the said peripheral openings through which is suspended said pump comprises a second housing contained within the rigid slab so as to confine the upper part of said pump including the pump head, at least one part of a vertical drive shaft connecting said pump to a motor and a flywheel carried by said shaft, said second housing being sealed by a cover positioned above the pump head and below the pump motor; wherein said first housing extends radially outwardly of the slab through a wall sealingly connected to the slab in such a way that said first housing provides a passage for the pipes of a secondary cooling circuit of the heat exchanger, said pipes extending from said heat exchanger and traversing said wall; wherein said second housing is extended radially outwardly into said slab so as to form a large horizontal passageway, said horizontal passageway being connected to a vertical passageway which extends only from said horizontal passageway to the top of said slab; wherein the thick slab contains another housing for handling fuel, said other housing being connected to the interior of the vessel and to a fuel handling installation by two transfer devices; wherein said rotary plug is covered by a detachable cover fixed to the slab; and wherein the thick slab has a rigid structure formed from steel sheets for constituting recesses and wherein each recess is provided in its floor with a lining of neutron-absorbing material.

4,508,679

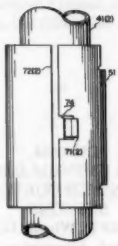
NUCLEAR FUEL ASSEMBLY SPACER

Bruce Matzner; Victor M. Horn; Michael V. Curulla, all of San Jose, Calif., and John F. Price, Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 20, 1982, Ser. No. 410,124

Int. Cl.³ G21C *3/34*

U.S. Cl. 376—438 **9 Claims**



3. A fuel assembly for a nuclear reactor comprising a plurality of elongated elements positioned in spaced array between upper and lower tie plates, at least one spacer positioned intermediate said upper and lower tie plates to provide lateral support for said elements, said spacer comprising a plurality of laterally positioned, conjoined tubular ferrules each providing a passage for a respective one of said elements, a selected one of said elements being fitted with a laterally extending lug, the ferrule providing a passage for said selected one of said elements being formed with a vertical slot to provide a passage through said ferrule for said laterally extending lug, a lateral cutout in ferrule wall adjacent said slot for receiving said lug when it is inserted into said slot and said selected one of said elements is rotated to move said lug into said cutout, and antirotation means to prevent subsequent rotation of said one of said elements whereby engagement of said lug in said cutout retains said spacer in its position intermediate said upper and lower tie plates.

4,508,680

METHOD OF MANUFACTURING A ROCKET COMBUSTION CHAMBER

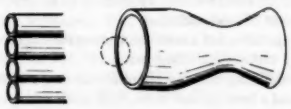
Masayuki Niino, Sendai; Nobuyuki Yatsuyanagi, Shibata; Akinaga Kumakawa, Souma; Akio Suzuki, Shibata; Hiromi Gomi, Shiosta; Hiroshi Sakamoto, Shibata; Masaki Sasaki, Shibata; Yoshimichi Masuda, Sendai; Ryuzo Watanabe, Sendai; Junjiro Takekawa, Sendai; Etsuo Ohtsuki, Sendai, and Terashi Isago, Shibata, all of Japan, assignors to National Aerospace Laboratory of Science and Technology Agency, Tokyo, Japan

Filed Jun. 1, 1983, Ser. No. 500,018

Claims priority, application Japan, Jun. 8, 1982, 57-98355

Int. Cl.³ B22F *7/00*

U.S. Cl. 419—5 **9 Claims**



1. A method for manufacturing the cooling wall of a rocket combustion chamber, comprising the steps of:

making an inner cylinder of a metallic material formed with grooves in the exterior surface thereof;

filling up the grooves of said inner cylinder with a filler;

compression-molding an outer cylinder on the inner cylinder by uniformly compressing metallic material powder of a predetermined thickness against the entire outermost surface of the inner cylinder having its grooves filled up with the filler;

removing the filler from the grooves of said inner cylinder, whereby the grooves remain as empty cooling channels; and

sintering the compression-molded powder to join the sintered outer cylinder material to the inner cylinder material and to form integral inner and outer cylinders with cooling channels therebetween.

4,508,681

METHOD OF MAKING SURFACE-HARDENED SINTER-IRON PART

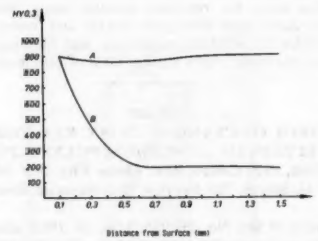
Werner Bodden, and Winfried Diegelmann, both of Heuchelheim, Fed. Rep. of Germany, assignors to Schunk & Ebe GmbH, Postfach, Fed. Rep. of Germany

Continuation of Ser. No. 301,238, Sep. 11, 1984, abandoned. This application Dec. 21, 1983, Ser. No. 564,350

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1980, 3035772

Int. Cl.³ B22F *3/00*

U.S. Cl. 419—29 **5 Claims**



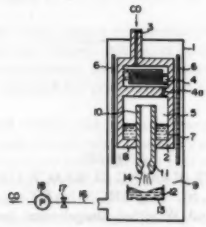
1. Method of making a surface-hardened sinter-iron part, comprising the steps of: producing a sinter-iron part by powder-metallurgy; impregnating the sinter-iron part with an alkali-silicate-solution; flushing off the alkali-silicate-solution adhering to the surface of the sinter-iron part; drying the impregnated sinter-iron part; and subjecting the sinter-iron part to a heat treatment for hardening said iron part; said impregnating step before said heat treatment step protecting said part against corrosion and producing an exclusively hardened surface of said part, said part after said heat treatment step having a predetermined depth of hardening independent of space filling and sinter density of the part, said part being resistant to gas penetration at elevated temperatures, said part having pores with upper surface closed by a substantially thin layer produced by said impregnating step so that a substantial residual porosity remains in said part for allowing fluids to stream freely through said part; said substantially thin layer being a glass-like protective layer located over walls of said pores to prevent gas from penetrating into metallic structure of said part; only exterior surfaces of said part which are free from silicate due to said flushing step becoming hardened; said impregnating step with said silicate solution preventing full-depth hardening throughout the part without filling said pores; said part being able to receive and retain substantial fluid for functioning as a porous sintered bearing part.

4,508,682

METHOD FOR MAKING COMPOSITE MATERIAL INCLUDING MATRIX METAL AND METAL CORED CERAMIC SURFACED FINE POWDER MATERIAL

Hirohisa Miura; Hiroshi Satou; Toshio Natsume, and Hidenori Katagiri, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 1, 1983, Ser. No. 481,466
Claims priority, application Japan, Apr. 2, 1982, 57-054874
Int. Cl.[3] B22F *9/00*; C22C *23/00*
U.S. Cl. 420—590 14 Claims



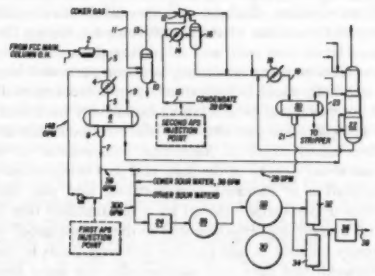
1. A method of making a composite material composed of fine powder particles embedded in matrix metal, each of the particles having a metallic core and a ceramic surface layer which is a compound of the metal composing said core and another element, the average value of the ratio of the thickness of the surface layer of a powder particle to the radius of the particle being substantially greater than 0.05, wherein said core metal in a gaseous form is mixed with said another element in the gaseous state, the resulting mixture being then passed through a convergent-divergent nozzle and being thereby rapidly cooled by adiabatic expansion, and blowing as a jet against the free surface of a molten mass of said matrix metal.

4,508,683

CONTROL OF CYANIDES IN FCC REACTOR BY INJECTION OF AMMONIUM POLYSULFIDE

Brian E. Doll, 1020 Central Ave., Ocean City, N.J. 08226, and Patrick G. Smyth, 726 Bayview Dr., Hermosa Beach, Calif. 90254

Continuation of Ser. No. 357,955, Mar. 15, 1982, abandoned. This application Nov. 10, 1983, Ser. No. 550,515
Int. Cl.[3] C23F *11/06*
U.S. Cl. 422—7 16 Claims



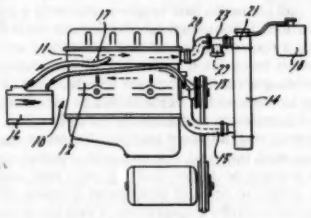
1. In a method of controlling the concentration of cyanides in the sour water system of a fluid catalytic cracking (FCC) reactor comprising injecting a solution of ammonium polysulfide (APS) into the water system of the reactor, the improvement wherein the solution of ammonium polysulfide is injected at the point in the sour water system wherein the concentration of cyanides complexed with metals is less than 125 ppm, thereby promoting the conversion of a large proportion of simple cyanides to thiocyanates and substantially preventing the formation of complex cyanides in excess of the amount thereof present at the point of injection.

4,508,684

PROTECTION OF ALUMINUM BASED STRUCTURES AGAINST HEAT TRANSFER CORROSION IN COOLING SYSTEMS

John Huff, Detroit; Ronald R. Wiggle, Dearborn, both of Mich., and Vladimir Hospadaruk, Clearwater, Fla., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 8, 1981, Ser. No. 300,367
Int. Cl.[3] C23F *11/00*
U.S. Cl. 422—8 24 Claims



1. A method of protecting heated aluminum based metals subject to heat transfer through the metal to a circulating aqueous cooling solution in contact therewith, comprising:

(a) exposing said heated metal to an initially constituted cooling solution comprised of an aqueous solution having dissolved therein a first substance effective to retard heat transfer corrosion of said metal, said first substance consisting of alkali metal silicate of the formula $M_2O.(SiO_2)_n$, where M is the alkali metal and n is 1.0 or greater in a concentration of at least 0.2 gram per liter after adjustment for any precipitation of said silicate on the walls of said metal;

(b) continuously or interruptedly exposing said initially constituted solution to an alkali metal silicate glass causing said glass to progressively dissolve in an amount to continuously stabilize the silicate concentration in solution at a level of at least 0.1 gram per liter of solution to and thereby to continuously substantially inhibit heat transfer corrosion of said metal.

19. An apparatus for a cooling system through which a fluid is positively circulated, comprising:

(a) walls defining cooling channels having a heat absorption zone and a heat release zone, said walls being comprised at least in part of aluminum;

(b) a conduit interconnecting said heat absorption and heat release zones;

(c) a coupling interposed in said conduit, said coupling having a chamber communicating with the interior of said conduit and exposed to the fluid passing therethrough; and

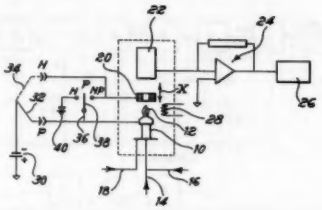
(d) a solid glass silicate body nested in said chamber for exposure to the moving cooling fluid.

4,508,685

MODIFIED-FLAME THERMIONIC DETECTOR FOR GAS CHROMATOGRAPHS AND METHOD FOR THE IDENTIFICATION OF COMPONENTS IN SAMPLE UNDER ANALYSIS

Giorgio Sisti, and Giuseppe Verga, both of Milan, Italy, assignors to Carlo Erba Strumentazione S.p.A., Milan, Italy

Filed May 26, 1982, Ser. No. 382,313
Claims priority, application Finland, Jun. 9, 1981, 8122199
Int. Cl.³ G01N *21/72*
U.S. Cl. 422—54 **8 Claims**



1. A modified flame thermionic detector for gas chromatographs, comprising:

flame nozzle means for generating a flame along an axis from an eluant gas from a chromatography system and a combustible gas;

collecting electrode means positioned coaxially to said flame nozzle means and connected to recording means for recording emitted current therefrom;

excitation electrode means having an alkali source of thermions for being positioned along the flame axis between the flame and said collecting electrode means with said flame nozzle means and said excitation electrode means connected in a continuous current electrical circuit;

said electrical circuit having a negative potential portion, a positive potential portion and a ground connection, and position switch means selectively switchable between a first position for connecting said flame nozzle means and said excitation electrode means to the negative potential of the circuit, a second position for connecting said flame nozzle means at the negative potential of the circuit and for electrically insulating said excitation electrode means with respect to the circuit, and a third position for connecting said excitation electrode means to the negative potential of the circuit and said flame nozzle means to ground; and

mobile support means having said excitation electrode means mounted thereon for supporting said excitation electrode means in a movable manner for selectively positioning said excitation electrode means at will along the flame axis between said flame nozzle means and said collecting electrode means.

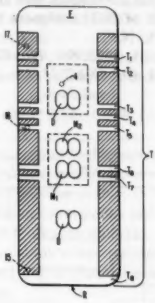
4,508,686

FILM STRIP FOR RAPID TEST OF A FILM PROCESSOR

Gary S. Shaber, Villanova, Pa., and Charles W. Buenzli, Jr., Richardson, Tex., assignors to Probex, Inc., Villanova, Pa.

Division of Ser. No. 212,742, Dec. 3, 1980, Pat. No. 4,365,895.
This application May 19, 1982, Ser. No. 379,981
Int. Cl.³ G01N *21/59, 21/84*
U.S. Cl. 422—55 **6 Claims**

1. A test film adapted for automatic testing of film processor function, said film having a lengthwise direction and including a plurality of test areas disposed at preselected locations along said lengthwise direction and preselected lengthwise test positions associated therewith, said film further including a lengthwise track comprising alternating signal and non-signal areas disposed at preselected lengthwise positions along said track, the length, position and spacing of said signal and non-signal areas being adapted to provide a continuous output signal indicative of the presence of said film in a reader therefor, counting signals indicative of the passage of said film length-



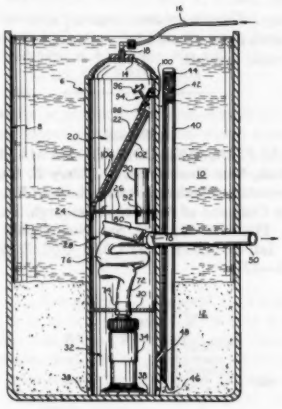
wise through a preselected number and sequence of positions relative to a reader therefor and to provide signals indicative of the relative locations of said test positions.

4,508,687

DEGASSING/BRINE TANK FOR POOL CHLORINATING SYSTEM

Richard W. Houghton, 344 Elm St., East Longmeadow, Mass. 01028

Filed Jun. 20, 1983, Ser. No. 505,928
Int. Cl.³ B01D *15/00*
U.S. Cl. 422—276 **9 Claims**



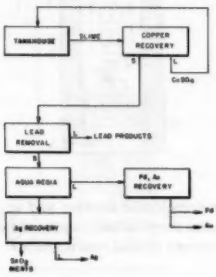
1. Degassing/brine tank for a pool chlorinator system including two upper and two lower chambers separated by an intermediate chamber having a coil tube therein, said tank including liquid flow passages for the gravity flow of liquid from the top of said tank successively from the first to the second of said upper chambers and then into said intermediate chamber, said tank also including means for conducting liquid successively upward from the first to the second of said lower chambers and then into said coil tube, said intermediate and upper chambers each including gas escape openings therethrough, and a mixing well in said intermediate chamber for combining liquid surrounding said coil with the liquid flowing within the coil, said coil including a radially extending upper leg portion adapted to extend through the side wall of said tank.

4,508,688

METHOD OF REGENERATING ACETATE IN A METAL REMOVAL PROCESS

Christopher C. Handy, Jr., Vineland, and D'Arcy H. Lorimer, Mercer County, both of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed May 31, 1983, Ser. No. 499,714
Int. Cl.[3] C01G 21/14
U.S. Cl. 423—92 19 Claims



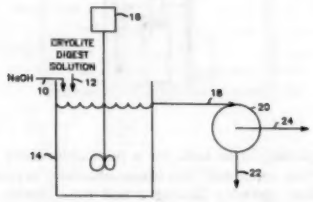
1. A method of separating acetate ions from sulfite and sulfate ions in an aqueous solution comprising the steps of:
(a) evaporating a substantial portion of the water from the acetate solution;
(b) crystallizing the acetate;
(c) drying the crystals;
(d) redissolving the acetate crystals in essentially water free alcohol;
(e) filtering off any insoluble material; and
(f) evaporating the alcohol from the solution to leave purified acetate crystals.

4,508,689

ALUMINUM-FLUORINE COMPOUND MANUFACTURE

J. Finley Bush, New Kensington, and Gary F. Gaydoski, Allegheny Township, Allegheny County, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 21, 1983, Ser. No. 515,805
Int. Cl.[3] C01F 1/00; C01B 7/00, 7/19
U.S. Cl. 423—127 10 Claims



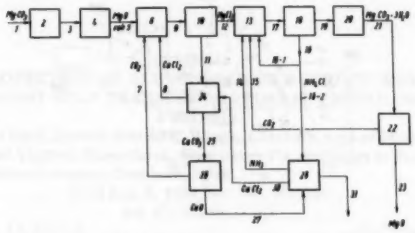
1. Method for improving yield of solid, sodium-poor fluoride material from an aqueous solution comprising ionic species containing sodium, aluminum and fluorine, the solution also containing sulfate ions, comprising neutralizing the solution from an acidic state saturated with respect to fluoride incompletely with an aqueous basic sodium compound to increase the pH into the range of about 5.0 to 5.6 to precipitate material consisting essentially of aluminum fluoride hydroxide hydrate in preference to more than minor amounts of chiolite or cryolite or other sodium compounds.

4,508,690

METHOD OF PRODUCING VERY PURE MAGNESIUM OXIDE

Albert Obrist, Elgg, and Balkrishna B. Gadgill, Raterschen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 154,821, May 30, 1980, abandoned. This application Aug. 29, 1983, Ser. No. 527,354
Claims priority, application Switzerland, Jun. 20, 1979, 5745/79
Int. Cl.[3] C01F 11/04
U.S. Cl. 423—173 13 Claims



1. A method of producing magnesium oxide comprising the steps of
obtaining an ore containing magnesium and being capable of producing magnesium oxide upon calcination;
calcining the ore to obtain magnesium oxide;
leaching the obtained magnesium oxide with carbon dioxide and a calcium chloride solution in a leaching stage to obtain a magnesium chloride solution of a concentration of from 15% to 25% and calcium carbonate;
introducing said magnesium chloride solution into a precipitator and adding continuously carbon dioxide and ammonia to the magnesium chloride solution in the precipitator to precipitate magnesium carbonate trihydrate crystals and to obtain an ammonium chloride solution while maintaining a temperature of from 25° C. to 45° C. and pH from 7.5 to 8.5;
continuously separating a part of the precipitated magnesium carbonate trihydrate crystals from the precipitation; and
decomposing the magnesium carbonate trihydrate in a first decomposing stage to obtain magnesium oxide and carbon dioxide.

4,508,691

METHOD FOR TREATING EXHAUST GASES WITH AN IMPROVED CATALYST COMPOSITION

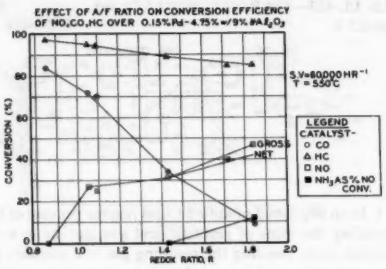
Karen M. Adams, Dearborn Heights, and Haren S. Gandhi, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 284,759, Jul. 20, 1981, abandoned. This application Aug. 16, 1982, Ser. No. 408,546
Int. Cl.[3] B01D 53/36
U.S. Cl. 423—213.5 14 Claims

1. In a process for treatment of exhaust gases from an internal combustion engine the steps of:
burning a hydrocarbon fuel or a fuel containing hydrocarbons and alcohol blends in the internal combustion engine thereby to generate exhaust gases from the internal combustion engine containing various amounts of unburned hydrocarbons, carbon monoxide and oxides of nitrogen depending upon operating conditions of the internal combustion engine; and
passing said generated exhaust gases over an improved catalyst composition in which a support medium for supporting a catalyst system had deposits thereon consisting essentially of:

palladium; and

finely divided tungsten, said tungsten being present on said support medium in quantities such that tungsten is available to substantially all of said palladium on the support medium so that said palladium/tungsten combination is effective in the catalytic oxidation of unburned hydrocarbons and carbon monoxide and the catalytic reduction of oxides of nitrogen without significant production of ammonia when the internal combustion engine is operating under fuel rich conditions.

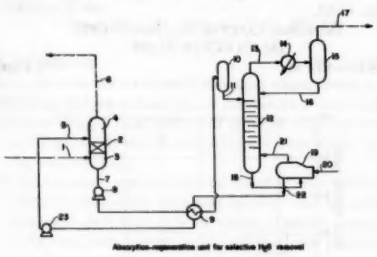


4,508,692

PROCESS FOR THE SELECTIVE REMOVAL OF HYDROGEN SULFIDE FROM GASEOUS MIXTURES WITH STRONGLY BASIC TERTIARY AMINO COMPOUNDS

David W. Savage, Summit, and Guido Sartori, Linden, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1982, Ser. No. 339,893
Int. Cl.³ B01D 53/34
U.S. Cl. 423—228 21 Claims



1. A process for the selective absorption of H_2S from a normally gaseous mixture containing H_2S and CO_2 comprising contacting under kinetic conditions said normally gaseous mixture with an absorbent solution comprising a strongly basic acyclic or alicyclic tertiary amino compound having a pK_a at 20° C. greater than 8.6, a boiling point at 760 mm of greater than 180° C. and further characterized as capable of selectively absorbing H_2S from said mixture at a "selectivity" value of at least about 10 at a loading of at least 0.1 moles of H_2S and CO_2 per moles of the amino compound under conditions whereby H_2S is selectively absorbed from said mixture.

4,508,693

SOLUTION REMOVAL OF HCN FROM GASEOUS STREAMS, WITH PH ADJUSTMENT OF REACTED SOLUTION AND HYDROLYSIS OF THIOCYANATE FORMED

Zaida Diaz, Houston, Tex.

Filed Nov. 29, 1983, Ser. No. 556,257
The portion of this patent subsequent to Feb. 5, 2002, has been disclaimed.
Int. Cl.³ C01C 3/00; C01B 17/16, 17/02
U.S. Cl. 423—236 3 Claims

1. A process for removing hydrogen cyanide from a gaseous stream containing hydrogen cyanide comprising

(a) contacting said gaseous stream in a contact zone with a solution containing ammonium polysulfide under conditions to convert hydrogen cyanide, and producing a solution containing ammonium polysulfide and ammonium thiocyanate, and a gas stream having reduced hydrogen cyanide content;

(b) removing solution containing ammonium polysulfide and ammonium thiocyanate from the contact zone;

(c) lowering the pH of the removed solution to decompose ammonium polysulfide and precipitate sulfur, and producing hydrogen sulfide, sulfur, and a remaining ammonium thiocyanate-containing solution, and removing sulfur from said remaining solution;

(d) hydrolyzing the ammonium thiocyanate in said remaining solution and producing ammonia, hydrogen sulfide, and carbon dioxide.

4,508,694

SEPARATION AND RECOVERY OF CARBON MONOXIDE BY COPPER (I) COMPLEXES

Gerald Doyle, Whitehouse Station; Roy L. Pruett, New Providence, and David W. Savage, Lebanon, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 6, 1983, Ser. No. 492,173
Int. Cl.³ B01D 53/34
U.S. Cl. 423—246 14 Claims

1. A process for separating carbon monoxide from a feedstream without copper metal formation which comprises the steps of:

(a) contacting the feedstream with a solution of a cuprous fluorinated acetylacetonate of the formula

$$Cu(R^1-\overset{O}{\overset{\|}{C}}-\overset{R^2}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-C_nF_{2n+1})$$

where R^1 is C_1–C_6 fluoroalkyl, C_1–C_8 alkyl, C_4–C_6 heterocycle containing O, S, or N or C_6–C_{10} aryl, R^2 is H or C_1–C_6 alkyl with the proviso that R^1 and R^2 together with the carbons to which they are attached may be joined together to form a C_6 ring and n is an integer from 1 to 8, in an organic solvent containing a stabilizing agent at a temperature sufficient to remove carbon monoxide by forming a first Cu(I) complex of the formula

$$[Cu(R^1-\overset{O}{\overset{\|}{C}}-\overset{R^2}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-C_nF_{2n+1})]_x(CO)_y$$

where R^1, R^2 and n are defined above, and x and y are 1 or 2, said stabilizing agent being characterized by being able to replace CO in the first Cu(I) complex thereby forming a second Cu(I) complex which is stable at temperatures wherein the first Cu(I) complex decomposes through loss of CO,

(b) heating to a temperature sufficient to decompose the first Cu(I) complex through loss of CO whereby the stabilizing agent replaces CO in the first Cu(I) complex and copper metal formation is prevented by formation of the second Cu(I) complex, and

(c) separating the CO.

4,508,695

PROCESS FOR PREPARING HYDRAZINES

Hans Osborg, P.O. Box 152, 80 Long View Rd., Port Washington, N.Y. 11050

Filed Apr. 22, 1982, Ser. No. 370,980
Int. Cl.[3] C01B *21/16*
U.S. Cl. 423—407 20 Claims

1. An improved process for preparing anhydrous hydrazine and hydrocarbyl-substituted hydrazines which comprises:

a. reacting a compound of the formula $X—NR_1R_2$, wherein X is selected from hydrogen, an alkali metal or an alkaline earth metal and R_1 and R_2 may be the same or different and are selected from hydrogen and hydrocarbyl radicals, with a chlorinating agent effective to produce a chloramine of the formula $Cl—NR_1R_2$, wherein R_1 and R_2 are as previously defined, without co-production of ammonium chloride;

b. reacting said chloramine with a tertiary amine of the formula $NR_3\ R_4\ R_5$, wherein R_3 R_4 and R_5 may be the same or different and represent hydrocarbyl radicals, to produce a tertiary hydrazinium chloride of the formula $NR_1R_2NR_3R_4R_5Cl$, wherein R_1, R_2, R_3, R_4 and R_5 are as previously defined; and

c. reacting said tertiary hydrazinium chloride with a compound of the formula ANR_6R_7, wherein A represents an alkali metal or an alkaline earth metal and R_6 and R_7 may be the same or different and are selected from hydrogen and hydrocarbyl radicals, under substantially anhydrous conditions to produce the desired product.

4,508,696

CYCLIC PROCESS FOR THE PRODUCTION OF HYDROGEN PEROXIDE

Michel Coingt, Lyons, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 526,206, Aug. 26, 1983, abandoned, which is a continuation of Ser. No. 361,585, Mar. 24, 1982, abandoned. This application Sep. 21, 1984, Ser. No. 654,040
Claims priority, application France, Apr. 7, 1981, 81 06923
Int. Cl.[3] C01B *15/02*
U.S. Cl. 423—588 3 Claims

1. In a recycle process for the production of hydrogen peroxide wherein at least one alkylanthraquinone is hyrogenated in a water-immiscible vehicle to convert the alkylanthraquinone to alkylhydroanthraquinone, the resulting liquid is treated with an oxygen-containing gas to form hydrogen peroxide and regenerate the starting alkylanthraquinone, the hydrogen peroxide so formed is extracted with water from the vehicle, and the quinones are recycled to the hydrogenation with a loss of quinone occurring during the process, the improvement comprising using a mixture of 2-ethylanthraquinone and 2-ethyl-5,6,7,8-tetrahydroanthraquinone as the quinones and introducing 2-ethyl-5,6,7,8-tetrahydroanthraquinone as the sole quinone to replace lost quinone, the proportion of the tetrahydroanthraquinone being about 90 percent of the two quinones and the quinone degradation product content of the liquid being greater than 150 g/L.

4,508,697

HYPOCHLORITE DESTRUCTION USING UREA

Harry O. Burrus, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 28, 1983, Ser. No. 518,020
Int. Cl.[3] C01D *3/04*
U.S. Cl. 423—499 8 Claims

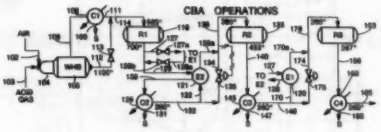
1. A continuous process for destroying alkali metal hypochlorite comprising in dilute aqueous solution reacting said alkali metal hypochlorite with from 50 to 90% of the stoichiometrically required amount of urea to react with the hypochlorite, at from 20° to 60° C., using a pH of from 6 to 8.

4,508,698

PROCESS AND SYSTEM FOR PRODUCING AND RECOVERING ELEMENTAL SULFUR

Robert L. Reed, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 30, 1983, Ser. No. 527,903
Int. Cl.[3] C01B *17/04*
U.S. Cl. 423—574 R 9 Claims



1. In an improved modified Claus reactor process of the type including the steps of reacting acid gas and air in a thermal reaction zone, reacting the resulting gas in a plurality of catalytic reaction zones arranged in series and maintained at progressively reduced temperatures, sulfur being removed in cooling zones between said reaction zones, the last of said catalytic reaction zones being maintained below the dew point of sulfur, the improvement comprising:

(a) operating only three catalytic reaction zones in series, two catalytic reaction zones above the dewpoint of sulfur and a last catalytic reaction zone below the dewpoint of sulfur for the recovery of sulfur and when the catalyst loading in said last catalytic reaction zone reaches a preselected level, heating the effluent from the cooling zone immediately preceding said last catalytic reaction zone to produce a regeneration gas;

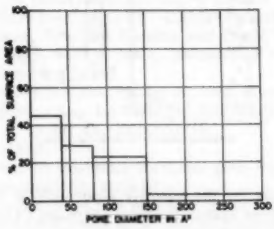
(b) feeding said regenerating gas to said last catalytic reaction zone until the catalyst is regenerated, the steps of producing and feeding a regeneration gas to said last catalytic reaction zone being carried out only for as long as necessary to regenerate the catalyst.

4,508,699

CLAUS PROCESS IMPROVEMENT

Richard J. Schoofs, Moraga, Calif., assignor to Schoofs, Inc., Moraga, Calif.

Filed Jan. 13, 1984, Ser. No. 570,397
Int. Cl.[3] C01B *17/04*
U.S. Cl. 423—574 R 3 Claims



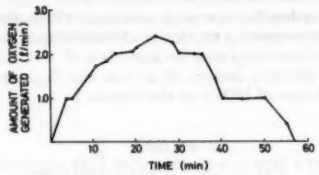
2. In a process for producing sulfur by contacting hydrogen sulfide and sulfur dioxide with a porous catalyst having a large surface area at elevated temperature, the imprpvement which comprises in the process a porous catalyst characterized by a proportion of its pores, having diameters within and throughout the range 80 to 150 A°, sufficient to provide at least 20% of the total surface area of the catalyst.

4,508,700

METHOD OF GENERATING OXYGEN FOR EMERGENCY USE

Yoshinori Hoshiko, Ueki, Japan, assignor to Hoshiko Medical Laboratories, Inc., Kamoto, Japan

Filed Apr. 25, 1983, Ser. No. 488,606
Claims priority, application Japan, Apr. 27, 1982, 57-69678
Int. Cl.[3] C01B *13/00*
U.S. Cl. 423—579 6 Claims



1. A method of generating oxygen for emergency use, comprising: p1 (a) solidifying a hydrogen peroxide-binding catalyst in a series of differently-concentrated aqueous solutions of at least one effective binding agent for said catalyst; and

(b) mixing therewith an addition compound of sodium bicarbonate and hydrogen peroxide, whereby, when a need for oxygen arises, water may be mixed therewith in order to cause a chemical reaction which generates oxygen more contiuously and constantly over an extended period of time than would be the case were said catalyst solidified in only one, uniformly concentrated aqueous solution of such binding agent.

4,508,701

EXTRACTION OF TUNGSTEN FROM SPENT OR SCRAP CATALYST MATERIALS

John B. Goddard, Grand Island, N.Y., and William N. Johnson, Ridgefield, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1983, Ser. No. 480,735
Int. Cl.[3] C01G *41/00*
U.S. Cl. 423—61 18 Claims

1. A process for extracting tungsten values from a silicate-containing, tungsten-bearing ore concentrate comprising:

(a) providing a finally-divided catalyst material containing predominantly Al_2O_3 and SiO_2 and from about 10 to 25% by weight WO_3;

(b) mixing said catalyst material together with finely-divided silicate-containing, tungsten-bearing ore concentrate in amounts such that at least about 2.0% by weight of the total tungsten values in the mixture are present in said catalyst material;

(c) digesting said mixture in an alkaline leach solution containing a material selected from the group consisting of sodium carbonate, sodium hydroxide, potassium carbonate and potassium hydroxide under pressure generated by the leach reaction and at an elevated temperature of at least about 200° C. for a period of time sufficient to extract substantially all of said tungsten values from the mixture components, the presence of said catalyst material substantially suppressing the dissolution of silica in the latch liquor; and

(d) filtering said leach liquor and recovering the substantially silica-free tungsten values from the resulting residue.

4,508,702

SUSTAINED RELEASE ASPIRIN

Charles H. Hsiao, Miami, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation of Ser. No. 388,183, Jun. 14, 1982, abandoned.
This application Feb. 3, 1984, Ser. No. 576,777
Int. Cl.[3] A61K *9/20, 9/28, 9/48*
U.S. Cl. 424—19 5 Claims

1. In a sustained release aspirin easily openable housing capsule or sealed pouch dosage form to permit the sprinkling onto food or mixing with a beverage, and, upon ingestion of said food or beverage, the continuous delivery of taste-masked aspirin into the gstrointestinal tract for a period of at least eight hours, the improvement consisting of a plurality of polymerically taste-masked coated aspirin crystal seeds each having therein a seed of pure aspirin as such, the majority of aspirin seeds having a mesh size of from about 30 to about 60 mesh, each of said otherwise unpleasant tasting aspirin seeds being individually coated with a polymeric mixture consisting of from about 1.5 to about 15 parts by weight ethyl cellulose and about one part by weight hydroxypropyl cellulose, and wherein the weight of the coating constitutes from about 3 to about 10% by weight of the said coated aspirin seeds.

4,508,703

PRODUCTION OF PULVERULENT MIXTURES OF LIPIDIC AND HYDROPHOBIC CONSTITUENTS

Gérard Redziniak, Sartrouville, and Alain Meybeck, Courbevoie, both of France, assignors to Parfums Christian Dior, France

Filed Feb. 10, 1983, Ser. No. 465,598
Claims priority, application France, Feb. 17, 1982, 82 02620
Int. Cl.[3] B01J *13/00;* A61K *9/42*
U.S. Cl. 424—38 34 Claims

1. A method for producing a pulverulent material of at least one amphiphilic lipidic constituent which deteriorates at a predetermined temperature, said material being used in particular for forming hydrated lipidic lamellar phase such as liposomes or the like, said method comprising

dissolving said amphiphilic lipidic constituent in a non-aqueous solvent having a boiling point below said predetermined temperature to form a solution of the same, and

atomizing the thus-formed solution in a flow of hot gaseous fluid above the boiling pont of said non-aqueous solvent and below said predetermined temperature to produce said pulverulent material without damage to said amphiphilic lipidic constituent.

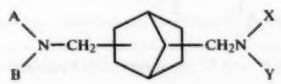
4,508,704

RADIOACTIVE METALS COMPLEXED WITH PHOSPHONATE DERIVATIVES OF BICYCLOHEPTANE BIS(ALKYLAMINES)

Jaime Simon, Angleton; David A. Wilson, Richwood, both of Tex., and Wynn A. Volkert, Columbia, Mo., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 27, 1984, Ser. No. 584,070
Int. Cl.[3] A61K *49/00, 43/00*
U.S. Cl. 424—14 20 Claims

1. A bone seeking complex of a radioactive nuclide and a compound having the structural formula



wherein substituents A, B, X and Y each are independently selected from radicals consisting of hydrogen, hydroxyalkyl (wherein the alkyl group contains 2–6 carbon atoms), methylenephosphonic; methylene-, ethylene- and propylenesulfonic; alkylcarboxylic acid radicals (having 2–4 carbon atoms)

and the alkali, alkaline earth metal, ammonium and amine salts of any of the phosphonic, sulfonic or carboxylic acid derivatives, and wherein at least one of the substituents is other than hydrogen.

4,508,705

SKIN TREATMENT COMPOSITION

Dwaipayan Chaudhuri, Ashford, and Malcolm R. Stebles, Maidenhead, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,453

Int. Cl.³ A61K *7/36, 9/12*

U.S. Cl. 424—47 **19 Claims**

1. An antiperspirant composition having a solid phase and a liquid phase, the solid phase comprising

(i) from 0.1 to 30% by weight of the composition of a moisture-absorbent water-insoluble polymer which is substantially dry-to-the-touch when swollen with water and which has a water absorption value of at least 2 and which is selected from the group consisting of

(a) a cross-linked gelatinised starch in which the degree of substitution of the cross-linking groups is 0.001 to 0.04;

(b) an ionic complex of a water-soluble anionic polyelectrolyte and a polyvalent metal cation having a valency of at least three, the cation being present in the amount of from 0.01 to 5 milliequivalents per g polyelectrolyte;

(c) a covalently cross-linked anionic olyelectrolyte wherein the anionic polyelectrolyte is selected from the group consisting of water-soluble derivatives of starch, water-soluble derivatives of cellulose, carboxylic homopolymers and copolymers containing at least 20 mole percent carboxylic acid units; and

(d) mixtures thereof;

and the liquid phase comprising:

(ii) from 0.1 to 15% by weight of the composition of a substantially water-insoluble surfactant having a melting point of from 30° to 75° C.; and

(iii) from 1 to 99.8% by weight of the composition of an organic solvent in which the polymer is substantially insoluble.

4,508,706

COMPOSITION FOR INCREASING MELANIN IN MAMMALIAN SKIN AND HAIR

John M. Pawelek, Hamden, Conn., and Patricia P. Agin, Cordova, Tenn., assignors to Yale University, New Haven, Conn. and Plough, Inc., Memphis, Tenn.

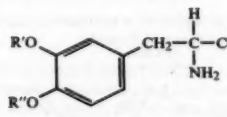
Filed Mar. 30, 1983, Ser. No. 480,465

Int. Cl.³ A61K *7/44, 31/66*

U.S. Cl. 424—60 **23 Claims**

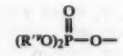
1. A composition for increasing melanization in the epidermis of a mammal comprising the admixture of

(a) an effective amount of at least one O-phosphorylated derivative of DOPA of the formula I

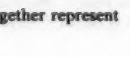


I

wherein R′ and R″ each represent hydrogen or



or R′ and R″ together represent

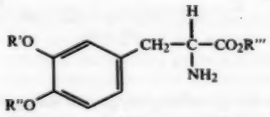


wherein R′′′ and R′′′′ each represent hydrogen or a pharmaceutically acceptable cation; with the provisos that R′ and R″ cannot both be hydrogen and

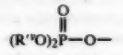
(b) a pharmaceutically acceptable carrier.

13. A method for increasing melanization in the epidermis of a mammal comprising the step of administering to the mammal a composition comprising the admixture of

(a) an effective amount of at least one O-phosphorylated derivative of DOPA of the formula I



wherein R′ and R″ each represent hydrogen or



or R′ and R″ together represent

wherein R′′′ and R′′′′ each represent hydrogen or a pharmaceutically acceptable cation; with the provisos that R′ and R″ cannot both be hydrogen and

(b) a pharmaceutically acceptable carrier.

4,508,707

HAIR TONIC COMPOSITION

Taizo Ayukawa, Tokyo, Japan, assignor to Kakudai Shosan Kabushiki Kaisha and Taizo Ayukawa, both of Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,216

Claims priority, application Japan, Nov. 9, 1981, 56-179195

Int. Cl.³ A61K *7/06*

U.S. Cl. 424—70 **4 Claims**

1. A hair tonic composition comprising 0.001% to 5% by weight of a gibberellin, a hair tonic solvent and conventional hair tonic ingredients.

4,508,708

VIRUS VACCINES AND PROCESS FOR PREPARING THE SAME

Antonius L. Van Wezel, Bilthoven, Netherlands, assignor to De Staat Der Nederlanden, Vertegenwoordigd doozde Minister van volksgezondheid en Milieuhygiene, BaLeidschendam, Netherlands

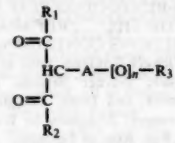
Filed Jun. 2, 1982, Ser. No. 384,386

Claims priority, application Netherlands, Jun. 5, 1981, 8102740

Int. Cl.³ A61K *39/13, 39/135*

U.S. Cl. 424—89 **24 Claims**

1. Vaccine containing one or more picorna virus antigens in the form of inactivated picorna virus or virus polypeptide thereof, free from live virus and containing a stabilizingly effective amount of at least one compound of formula 1



in which R_1 and R_2 each represent an alkyl or alkoxy group of not more than 6 carbon atoms; A represents a bivalent hydrocarbon radical of 3–12 carbon atoms, R_3 represents an unsubstituted or substituted phenyl radical and n represents one of the figures 0 or 1.

4,508,709

PROCESS FOR PURIFYING FACTOR VIII:C

Godfrey W. Amphlett, Mount Vernon, N.Y., and Michael E. Hrinda, Wilton, Conn., assignors to Armour Pharmaceutical Company, Tarrytown, N.Y.

Filed Dec. 5, 1983, Ser. No. 557,805
Int. Cl.³ A61K *35/16*
U.S. Cl. 424—101 **21 Claims**

1. A process for purifying Factor VIII:C from source material containing antihemophilic factor, comprising

(a) providing an aqueous solution of said source material which has a pH of 6.0 to about 8.0, and a conductivity of about 25 mS/cm to 35 mS/cm,

(b) equilibrating aminohexyl agarose to the pH of said solution,

(c) adsorbing antihemophilic factor from said solution onto said equilibrated aminohexyl agarose,

(d) eluting Factor VIII:R from the aminohexyl agarose, and then

(e) eluting the Factor VIII:C from the aminohexyl agarose.

4,508,710

IN VITRO AND IN VIVO TREATMENT OF CANCER CELLS AND TREATMENT OF VIRUSES WITH A TRIPEPTIDE COMPOUND

Augusto DeBarbieri, Milan, Italy, and Julius G. Bekesi, Teaneck, N.J., assignors to Proter S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 455,477, Jan. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 311,646, Oct. 15, 1981, Pat. No. 4,428,875, which is a continuation-in-part of Ser. No. 173,621, Jul. 30, 1980, Pat. No. 4,314,999, which is a continuation-in-part of Ser. No. 929,237, Jul. 31, 1978, Pat. No. 4,216,208. This application Feb. 23, 1983, Ser. No. 468,036
Int. Cl.³ A61K *37/02*; C07C *103/52*
U.S. Cl. 514—19 **17 Claims**

1. A method of controlling human and animal tumor cells transplanted into a living animal comprising injecting the animal with a therapeutically effective amount of a tripeptide compound, said tripeptide has members selected from a group consisting of:

(1) 3-(p-fluorophenyl)-L-alanyl-3-[m-bis(2-chloroethyl)-aminophenyl]-L-alanyl-L-methionine

(2) 3-[m-bis(2-chloroethyl)aminophenyl]-L-alanyl-3-(p-fluorophenyl)-L-alanyl-L-methionine

(3) 3-(p-fluorophenyl)-L-alanyl-L-methionyl-3-[m-bis(2-chloroethyl)aminophenyl]-L-alanine

(4) 3-[m-bis(2-chloroethyl)aminophenyl]-L-alanyl-L-methionyl-3-(p-fluorophenyl)-L-alanine

(5) L-methionyl-3-(p-fluorophenyl)-L-alanyl-3-[m-bis(2-chloroethyl)aminophenyl]-L-alanine

(6) L-methionyl-3-[m-bis(2-chloroethyl)aminophenyl]-L-alanyl-3-(p-fluorophenyl)-L-alanine.

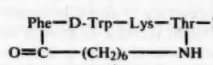
4,508,711

CYCLIC PENTAPEPTIDE DISPLAYING SOMATOSTATIN ANTAGONISM AND METHOD OF TREATMENT OF MAMMALS THEREWITH

David H. Coy, New Orleans, and William A. Murphy, Slidell, both of La., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 485,770, Apr. 18, 1983, abandoned. This application Feb. 10, 1984, Ser. No. 578,921
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 514—11 **8 Claims**

1. A cyclic pentapeptide compound having the structure:



or a pharmaceutically acceptable salt thereof.

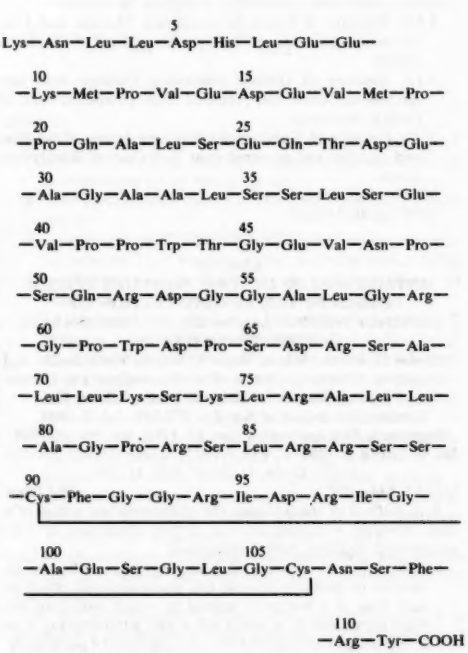
4,508,712

ATRIAL PEPTIDE

Philip Needleman, Olivette, Mo., assignor to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 569,684, Jan. 10, 1984, , which is a continuation-in-part of Ser. No. 551,372, Nov. 10, 1983,. This application May 4, 1984, Ser. No. 607,064
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 514—11 **6 Claims**

1. A peptide having potent natriuretic, diruetic and vasodilating activity comprising the following amino acid sequence:



4,508,713

METHOD OF REDUCING DENTAL CARIES

John J. Stroz, Monroe, Conn., and Donald A. M. Mackay, Pleasantville, N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 492,990, May 9, 1983, Pat. No. 4,457,921, which is a continuation of Ser. No. 248,087, Mar. 27, 1981, abandoned. This application Apr. 25, 1984, Ser. No. 596,873

Int. Cl.[3] A61K *9/68, 31/70, 31/715*

U.S. Cl. 514—60 9 Claims

1. A method of treating teeth to inhibit or prevent dental plaque and/or caries in the presence of sucrose at a concentration of 0.4% or more and *Streptococcus mutans* having near optimum growth occurring in an environment of 0.4 to 0.5% of sucrose, with a slight increase in growth resulting with an increase of the sucrose level to up to 2%, the improvement comprising contacting said teeth with a composition comprising hydrogenated starch hydrolysate as a non-metabolizing carbohydrate sugar substitute in such amounts as to provide about a 0.25:1.0 to about 4.0:1.0 ratio of said sucrose to said sugar substituted at a final carbohydrate concentration of up to 2.0% so as to thereby inhibit or prevent the growth of extracellular polysaccharide production, in the presence of said teeth, fromsaid sucrose by said *Streptococcus mutans* to an extent greater than that achieved merely by replacement of some or all of said sucrose by non-metabolized carbohydrate and thereby prevent the exposure of said teeth to the dental plaque and/or caries causitive effects of said sucrose.

4,508,714

ORGANIC SCALP LOTION

Tihomir Cecic, and Norma Cecic, both of 8641 NW. 23rd St., Pembroke Pines, Fla. 33024

Filed Nov. 14, 1983, Ser. No. 551,306

Int. Cl.[3] A61K *35/78*

U.S. Cl. 424—195.1 1 Claim

1. A composition of organic ingredients, constituting an organic scalp lotion comprising in percent by volume:

8.6% Tincture of Cinchona containing Quinine and Cinchonidine and prepared from powdered bark of Cinchona plants;

2.1% Tincture of Quillaia containing Quillajic acid and quillaja sapotoxin and prepared from powdered bark of Qullaja Saponaria;

2.1% Tincture of Eucalyptus containing tannin, Kino Red and catechin and prepared from Red Gum of Eucalyptus plants;

85.1% ethyl alcohol; and

2.1% distilled water.

4,508,715

ANTAGONISM OF CENTRAL NERVOUS SYSTEM DRUGS BY THE ADMINISTRATION OF 4-AMINOPYRIDINE ALONE OR IN COMBINATION WITH OTHER DRUGS

Nicholas H. Booth, Athens; Roger C. Hatch, Watkinsville, and Lester M. Crawford, Athens, all of Ga., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.

Continuation-in-part of Ser. No. 279,519, Jul. 1, 1981, abandoned. This application Apr. 13, 1982, Ser. No. 367,864

Int. Cl.[3] A61K *31/485, 31/495, 31/515, 31/335, 31/415, 31/445, 31/475, 31/44, 31/54, 31/045, 31/195*

U.S. Cl. 514—280 19 Claims

1. A method of antagonizing the pharmacologic action of a drug affecting a central nervous system dopamine or α-2-andrenergic receptor, which comprises:

administering an amount of 4-aminopyridine effective to reverse or partially reverse the pharmacologic effect of said drug to a human or animal to which said drug has been administered, wherein when said administering is to a human, said amount is 0.15 to 0.5 mg/kg of 4-aminopyridine.

4,508,716

[1,2]-FUSED 1,4-BENZODIAZEPINE COMPOUNDS, PROCESS FOR THE[1] [2]REPARATION AND COMPOSITIONS CONTAINING THEM

Hans Liepmann; Michael Ruhland, both of Hanover; Herbert Muesch, Wennigsen; Werner Benson, Hanover; Henning Heinemann, Hanover, and Horst Zeugner, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

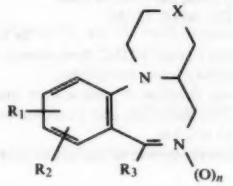
Filed Dec. 27, 1982, Ser. No. 453,785

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151597

Int. Cl.[3] A61K *31/495;* C07D *487/04, 498/04, 513/04*

U.S. Cl. 514—220 13 Claims

1. A [1,2]-fused 1,4-benzodiazepine compound corresponding to the formula I



I

wherein

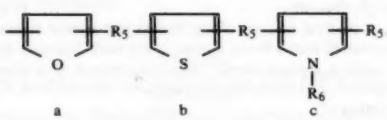
X represents an oxygen or sulfur atom or an amino group =N—R_4 in which R_4 represents a hydrogen atom, a C_1–C_5-alkyl group, a C_2–C_5-alkyl group which is terminally substituted by a methoxy group or a hydroxyl group, a C_3–C_5-alkenyl group or a cyclopropylmethyl group;

R_1 represents a hydrogen or halogen atom, a lower alkyl group, a lower alkoxy group or a nitro group, and

R_2 represents a hydrogen atom or a lower alkyl group, or

R_1 and R_2 are bonded to adjacent carbon atoms and together denote a methylenedioxy or ethylenedioxy group;

R_3 represents a group selected from the group consisting of groups corresponding to the formulas a, b and c:



a b c

in which

R_5 represents a hydrogen, fluorine, chlorine or bromine atom or a lower alkyl group, and

R_6 represents a hydrogen atom or a methyl group; and

n is zero or, if R_3 is a group corresponding to formula a or b, is zero or 1;

and the optical isomers and acid addition salts of said compound.

11. A pharmaceutical composition comprising a neuroleptically active amount of a compound according to claim 1 and a pharmaceutical adjuvent.

4,508,717
CEPHALOSPORIN DERIVATIVES, THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Christian Berger, Ecully; Daniel Farge, Thiais; Claude Moutonnier, Le Plessis Robinson; Jean-Francois Peyronel, Palaiseau, and Bernard Plau, Creteil, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

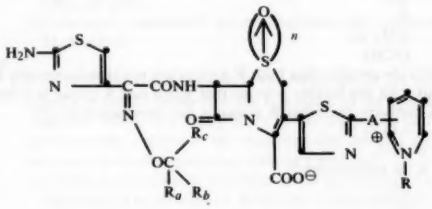
Filed Aug. 11, 1983, Ser. No. 522,359

Claims priority, application France, Aug. 13, 1982, 82 14092

Int. Cl.[3] **A61K** *31/545;* **C07D** *501/36*

U.S. Cl. 514—203 **17 Claims**

1. A cephalosporin derivative of the formula:



in which the symbol A represents a single bond or a divalent radical chosen from —CH_2—, —NH—or —NHCO—, attached to the 3-position or 4-position of the pyridinio radical, the symbol R represents a methyl, carboxymethyl, carbamoylmethyl, benzyl or allyl radical, and either the symbols R_a, R_b and R_c each represent a hydrogen atom, or the symbol R_a represents a carboxyl radical and the symbols R_b and R_c, which are identical or different, represent hydrogen atoms or alkyl radicals having 1 to 4 carbon atoms, or together form an alkylene radical containing 2 to 5 carbon atoms, and n is equal to 0 or 1, the group —$OCR_aR_bR_c$ being in the syn position, and if appropriate the isomeric forms of the said cephalosporin derivative and mixtures thereof, or an addition salt thereof with an acid, or, if appropriate, a metal salt thereof or an addition salt thereof with a nitrogen-containing base.

17. A pharmaceutical composition which comprises, as active ingredient, a cephalosporin as claimed in claim **1** or an addition salt thereof with an acid, or a metal salt thereof, or an addition salt thereof with a nitrogen-containing base, in association with a pharmaceutically acceptable carrier or coating.

4,508,718
CARDIOTONIC AND ANTIHYPERTENSIVE OXADIAZINONE COMPOUNDS

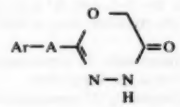
Ila Sircar, Ann Arbor; Michael H. Cain, Saline, and John G. Topliss, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 16, 1984, Ser. No. 571,057

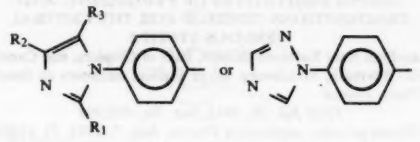
Int. Cl.[3] **A61K** *31/535;* **C07D** *413/10*

U.S. Cl. 514—238 **12 Claims**

1. A compound of the formula



wherein Ar is a group of the formula



in which R_1, R_2, and R_3 are each independently hydrogen, lower alkyl or CH_2OH, and R_2 and R_3 when taken together may form a five- or six-membered saturated or unsaturated ring; A is a bond, 1–4 carbon alkylene or 2–4 carbon alkenylene, and pharmaceutically acceptable acid addition salts thereof.

10. A pharmaceutical composition comprising an effective amount of a compound according to claim **1** and a pharmaceutically acceptable carrier.

4,508,719
HYDROXYIMINO AND ALKOXYIMINO DERIVATIVES OF 1,4-DIHYDROPYRIDINE AND ANTI-HYPERTENSIVE COMPOSITIONS

Silvia Z. Tricerri, Carimate; Cesare Casagrande, Arese; Franco De Marchi, Milan, and Massimo Nicola, Pavia, all of Italy, assignors to Pierrel S.p.A., Napoli, Italy

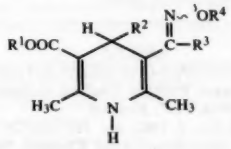
Filed May 26, 1983, Ser. No. 498,248

Claims priority, application Italy, Jun. 3, 1982, 21679 A/82; May 11, 1983, 21044 A/83

Int. Cl.[3] **A61K** *31/535, 31/455;* **C07D** *211/82, 413/12*

U.S. Cl. 514—236 **17 Claims**

1. A compound of formula I:



(I)

wherein

R^1 is a linear or branched alkyl radical containing between 1 and 5 carbon atoms, said alkyl radical being unsubstituted or substituted by an alkoxy group;

R^2 is an unsubstituted phenyl or phenyl substituted by a nitro group;

R^3 is hydrogen or a linear or branched alkyl residue containing between 1 and 4 carbon atoms, said alkyl radical being unsubstituted or substituted by at least one alkoxy or fluorine atom or both alkoxy and fluorine atoms;

R^4 is hydrogen or a linear or branched alkyl containing between 1 and 4 carbon atoms, said alkyl radical being unsubstituted or substituted by alkoxy, carbalkoxy, dialkylamino, monocyclic aryl, or monocyclic heterocyclic ring which is 1-piperidinyl, 4-morpholinyl, pyridyl, pyrazinyl, pyrimidyl, furyl, imidazolyl, imidazolinyl, thienyl, thiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, said monocyclic ring being unsubstituted or being mono- or di-substituted with alkyl, alkoxy, halogen, amino, acylamino, alkylamino, dialkylamino, carbalkoxy, hydroxy, nitrile, nitro and SO_n-alkyl, wherein n=0,1 or 2, or trifluoromethyl or R^4 is alkenyl or cyclo (C_3–C_6) alkyl

and its enantiomers, racemates, diastereoisomers and isomers (E) and (Z) thereof, and their salts with a pharmaceutically acceptable acid.

16. An antihypertensive composition which consists of an amount of a compound of claim **1** effective in the treatment of hypertension, and a pharmaceutically acceptable carrier.

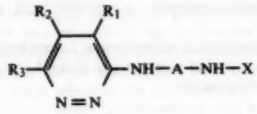
4,508,720

AMINO DERIVATIVES OF PYRIDAZINE, AND COMPOSITIONS THEREOF FOR THE CENTRAL NERVOUS SYSTEM

Jean-Paul Kan; Kathleen Bizière, both of Clapiers, and Camille G. Wermuth, Strasbourg, all of France, assignors to Sanofi, Paris, France

Filed Jul. 29, 1982, Ser. No. 402,906
Claims priority, application France, Aug. 7, 1981, 81 15380
Int. Cl.³ A61K *31/50*; C07D *237/20*
U.S. Cl. 514—247 **3 Claims**

1. An amino derivative of pyridazine of the general formula:



wherein:

R_1 is selected from the group consisting of hydrogen and a lower alkyl group having from 1 to 4 carbon atoms;

R_2 is hydrogen;

R_3 is selected from the group consisting of a phenyl group and a hydroxyphenyl group;

A is a linear or branched alkylene group having 2 to 5 carbon atoms; and

X is selected from the group consisting of hydrogen and a C_1–C_4 alkyl group, as well as the salts of said derivatives with the pharmaceutically acceptable acids.

2. A pharmaceutical composition useful in the treatment of psychomotor behavioral disorders comprising an effective amount of a compound within the scope of claim 1 and a pharmaceutically acceptable carrier.

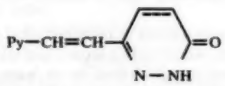
4,508,721

PYRIDAZIN-3-ONE DERIVATIVES

Rodney B. Hargreaves, Poynton, England, assignor to Imperial Chemical Industries, PLC, England

Filed Nov. 3, 1982, Ser. No. 438,729
Claims priority, application United Kingdom, Nov. 12, 1981, 8134177
Int. Cl.³ C07D *237/06*; A61K *31/50*
U.S. Cl. 514—252 **6 Claims**

1. A heterocyclic compound of the formula:



wherein the dotted line in the pyridazine nucleus indicates that a double bond is optional in this position, and wherein Py is a 4-pyridinyl group which is unsubstituted,
or an acid-addition salt thereof.

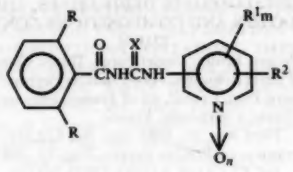
4,508,722

1-BENZOYL-3-(ARYLPYRIDYL)UREA COMPOUNDS

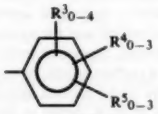
John L. Miesel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 264,494, May 18, 1981, Pat. No. 4,405,552, which is a continuation-in-part of Ser. No. 240,331, Mar. 3, 1981, abandoned. This application Jun. 13, 1983, Ser. No. 503,971
Int. Cl.³ A61K *31/44*
U.S. Cl. 514—353 **16 Claims**

1. A method for reducing a population of manure-breeding insects which comprises orally administering to a warm-blooded animal an insecticidally effective amount of an active agent which is a compound of the formula



wherein each R is independently
H,
Br,
Cl,
F,
CH_3, or
OCH_3
with the proviso that both R groups are not simultaneously H, and with the further proviso that when one R group is fluoro or methoxy the other R group is not simultaneously H:
X=O or S;
n=0–1;
R^1 is independently
Cl,
Br,
CH_3, or
CH_3CH_2;
m=0–2; and
R^2 is a phenyl radical of the formula:



R^3 represents
Br,
Cl, or
F;
R^4 represents
CF_3,
OCF_3,
OC_2F_5,
OCF_2CF_2H, or
SCF_3;
R^5 represents
Methyl,
Ethyl,
Methoxy,
Ethoxy,
SCH_3, or
SCH_2CH_3;
with the limitation that the entire substituted phenyl radical bears
(1) not more than 4 substituents, when all substituents are halo substituents;
(2) not more than 3 substituents, when any one substituent is other than halo;
(3) not more than 2 different substituents;
and wherein positions on the pyridine ring are as follows:
(1) the NH to pyridine bond is at the 2-position of the pyridine ring, the R^2 group is at the 5-position of the pyridine ring, and when m=1–2, any R^1 is at the 4-, 6-, or 4 and 6-positions of the pyridine ring, subject to the limitation that
(a) when simultaneously R^1 represents bromo and n=0, m=1 and R^1 is at the 6-position;
(b) when simultaneously R^1 represents Cl and m=1, R^1 is at the 6-position;
(c) when simultaneously m and n=0 and each R repre-

sents OCH_3, R^2 is not unsubstituted phenyl, 3-chlorophenyl, 3,4-dichlorophenyl, or 4-methoxyphenyl;

(d) when simultaneously m and n=0 and each R represents CH_3, R^2 is not 4-chlorophenyl;

(e) when simultaneously m and n=0 and one R represents Cl and the other R represents, H, R^2 is not 3-chlorophenyl, 3,4-dichlorophenyl, 4-tolyl, 4-methoxyphenyl, or 3,4,5-trimethoxyphenyl;

(f) when simultaneously m=2 and n=0 and one R^1 moiety represents CH_3 or CH_3CH_2, the other R^1 moiety is not chloro or bromo;

(g) when n=1, neither R represents CH_3 or OCH_3, any R^1 represents CH_3 or Cl, and R^2 represents a para-substituted phenyl in which the substituent is Br, Cl, F, CH_3, or CF_3;

(h) when n=1 and one R group simultaneously represents H, m=1–2;

or

(2) the NH to pyridine bond is at the 3-position of the pyridine ring, the R^2 group is at the 6-position of the pyridine ring, and when m=1, any R^1 is at the 5-position of the pyridine ring, subject to the limitation that m=0–1 and

(a) when n=0, R^1 represents CH_3 or CH_3CH_2;

(b) when simultaneously n=0 and one R represents Cl and the other R represents H, R^2 is not 3-chlorophenyl;

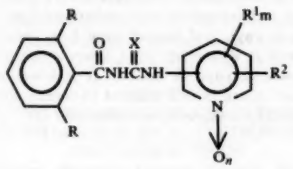
(c) when simultaneously n=0 and one R represents CH_3 and the other R represents H, R^2 is not unsubstituted phenyl;

(d) when n=1, each R independently represents Cl or F, any R^1 represents CH_3, and R^2 represents a para-substituted phenyl in which the substituent is Br, Cl, F, CH_3, or CF_3;

or an agriculturally acceptable acid addition salt thereof.

8. The method of claim 7 wherein the compound is administered to the animal as an additive to the animals feed.

15. A feed premix comprising a physiologically acceptable carrier and an active agent which is a compound of the formula



wherein each R is independently

H,
Br,
Cl,
F,
CH_3, or
OCH_3

with the proviso that both R groups are not simultaneously H, and with the further proviso that when one R group is fluoro or methoxy the other R group is not simultaneously H:

X=O or S;

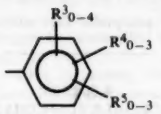
n=0–1;

R^1 is independently

Cl,
Br,
CH_3, or
CH_3CH_2;

m=0–2; and

R^2 is a phenyl radical of the formula:



R^3 represents

Br,
Cl, or
F;

R^4 represents

CF_3,
OCF_3,
OC_2F_5,
OCF_2CF_2H, or
SCF_3;

R^5 represents

Methyl,
Ethyl,
Methoxy,
Ethoxy,
SCH_3, or
SCH_2CH_3;

with the limitation that the entire substituted phenyl radical bears

(1) not more than 4 substituents, when all substituents are halo substituents;

(2) not more than 3 substituents, when any one substituent is other than halo;

(3) not more than 2 different substituents;

and wherein positions on the pyridine ring are as follows:

(1) the NH to pyridine bond is at the 2-position of the pyridine ring, the R^2 group is at the 5-position of the pyridine ring, and when m=1–2, any R^1 is at the 4-, 6-, or 4 and 6-positions of the pyridine ring, subject to the limitation that

(a) when simultaneously R^1 represents bromo and n=0, m=1 and R^1 is at the 6-position;

(b) when simultaneously R^1 represents Cl and m=1, R^1 is at the 6-position;

(c) when simultaneously m and n=0 and each R represents OCH_3, R^2 is not unsubstituted phenyl, 3-chlorophenyl, 3,4-dichlorophenyl, or 4-methoxyphenyl;

(d) when simultaneously m and n=0 and each R represents CH_3, R^2 is not 4-chlorophenyl;

(e) when simultaneously m and n=0 and one R represents Cl and the other R represents H, R^2 is not 3-chlorophenyl, 3,4-dichlorophenyl, 4-tolyl, 4-methoxyphenyl, or 3,4,5-trimethoxyphenyl;

(f) when simultaneously m=2 and n=0 and one R^1 moiety represents CH_3 or CH_3CH_2, the other R^1 moiety is not chloro or bromo;

(g) when n=1, neither R represents CH_3 or OCH_3, any R^1 represents CH_3 or Cl, and R^2 represents a para-substituted phenyl in which the substituent is Br, Cl, F, CH_3, or CF_3;

(h) when n=1 and one R group simultaneously represents H, m=1–2;

or

(2) the NH to pyridine bond is at the 3-position of the pyridine ring, the R^2 group is at the 6-position of the pyridine ring, and when m=1, any R^1 is at the 5-position of the pyridine ring, subject to the limitation that m=0–1 and

(a) when n=0, R^1 represents CH_3 or CH_3CH_2;

(b) when simultaneously n=0 and one R represents Cl and the other R represents H, R^2 is not 3-chlorophenyl;

(c) when simultaneously n=0 and one R represents CH_3 and the other R represents H, R^2 is not unsubstituted phenyl;

(d) when n=1, each R independently represents Cl or F, any R^1 represents CH_3, and R^2 represents a para-sub-

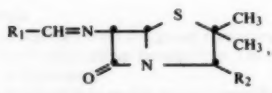
stituted phenyl in which the substituent is Br, Cl, F, CH_3, or CF_3;
or an agriculturally acceptable acid addition salt thereof.

4,508,723
6-AZAOLIGOCYCLOALKYLMETHYLENEAMINOPENAM COMPOUNDS

Karl Schaffner, Oberwil, and Riccardo Scartazzini, Basel, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 183,899, Sep. 4, 1980, , which is a continuation of Ser. No. 906,378, May 16, 1978, abandoned. This application Jun. 4, 1982, Ser. No. 385,139
Claims priority, application Luxembourg, May 17, 1977, 77362
Int. Cl.³ A61K *31/38;* **C07D** *499/32*
U.S. Cl. 514—195 **18 Claims**

1. A 6-amino-penam compound of the formula



(I)

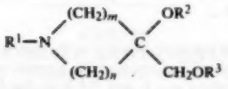
wherein R_1 is azabicycloalkyl, azatricycloalkyl, azabicycloalkenyl, oxaazabicycloalkyl, diazabicycloalkyl, azatricycloalkenyl, oxaazatricycloalkyl or diazatricycloalkyl, which is bonded via a ring nitrogen atom and has 1–3 endo bridge atoms, and contains a total of 7 to 12 ring atoms, wherein a ring carbon atom is unsubstituted or substituted by hydroxy, hydroxyl esterified by lower alkanoyl, carboxyl-lower alkanoyl, di-lower alkylamino-lower alkanoyl, lower alkoxycarbonyl, lower alkoxycarbonyl monosubstituted to trisubstituted by chlorine, or benzoyl, nicotinoyl, carbamoyl or toluene-sulfonyl, or hydroxyl etherified by lower alkyl, lower alkyl monosubstituted to trisubstituted by lower alkoxy, carboxyl, di-lower alkylamino, phenyl or anisyl, wherein a second nitrogen atom is substituted by hydrogen or lower alkyl, R_2 is free carboxyl or carboxyl esterified by a conventional physiologically detachable group, or a pharmaceutically acceptable salt of said compound.

4,508,724
ARYLOXYMETHYLPYRROLIDINOLS AND PIPERIDINOLS HAVING ANTIDEPRESSANT, ANTIARRHYTHMIC OR HYPOTENSIVE ACTIVITY

Chandler R. Taylor, Jr., Mechanicsville, and Harold F. Stauffer, Jr., Midlothian, both of Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

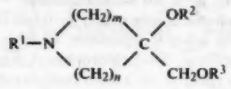
Filed Feb. 3, 1984, Ser. No. 576,904
Int. Cl.³ C07D *211/48, 207/12;* **A61K** *31/40, 31/445*
U.S. Cl. 514—317 **49 Claims**

1. A compound selected from aryloxymethylpyrrolidinol and piperidinol compounds of the formula:



wherein R^1 is hydrogen, loweralkyl or phenylloweralkyl, R^2 is hydrogen, loweralkyl or acyl; R^3 is phenyl, 1-naphthyl, 2-naphthyl, 1H-2,3-dihydroinden-4-yl or 1H-2,3-dihydroinden-5-yl; m is 2 or 3, and n is 1 or 2, with the proviso that m is never 3 when n is 2; and the pharmaceutically acceptable salts thereof.

32. A pharmaceutical composition comprising a pharmaceutical carrier and a compound effective as an antiarrhythmic, antidepressant or antihypertensive when administered in unit dosage form selected from aryloxymethylpyrrolidinol and piperidinol compounds of the formula:



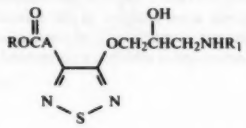
wherein R^1 is hydrogen, loweralkyl or phenylloweralkyl; R^2 is hydrogen, loweralkyl or acyl; R^3 is phenyl, 1-naphthyl, 2-naphthyl, 1H-2,3-dihydroinden-4-yl or 1H-2,3-dihydroinden-5-yl; m is 2 or 3 and n is 1 or 2 with the proviso that m is never 3 when n is 2; and the pharmaceutically acceptable salts thereof.

4,508,725
ESTERS OF 3-(3-SUBSTITUTED-AMINO-2-HYDROXYPROPOXY)-4-SUBSTITUTED-1,2,5-THIADIAZOLE DERIVATIVES

William L. Matier, Libertyville; Paul W. Erhardt, Mundelein, and Ghanshyam Patil, Vernon Hills, all of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 22, 1982, Ser. No. 452,280
Int. Cl.³ C07D *285/10;* **A61K** *31/41*
U.S. Cl. 514—362 **35 Claims**

1. A compound having the formula



wherein R is lower alkyl, lower cycloalkyl, lower haloalkyl, lower alkyl carboxymethyl, aryl carboxymethyl, lower alkenyl, lower alkynyl, aryl having from 6 to about 10 carbon atoms, or aralkyl; R_1 is lower alkyl, lower hydroxyalkyl, lower alkenyl, lower alkynyl, or aralkyl; A is lower alkylene, or lower alkene having from 1 to about 10 carbon atoms; and the pharmaceutically acceptable salts thereof.

4,508,726
TREATMENT OF PANIC DISORDERS WITH ALPRAZOLAM

James H. Coleman, Cumberland, R.I., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 418,922, Sep. 16, 1982, abandoned. This application Aug. 1, 1983, Ser. No. 518,332
Int. Cl.³ A61K *31/41*
U.S. Cl. 514—220 **3 Claims**

1. A process for preventing or treating panic attacks comprising the administration to a human subject susceptible to panic attacks, in unit dosage form, from about 0.01 mg to about 0.4 mg/kg body weight of 8-chloro-1-methyl-6-phenyl-4H-s-triazolo[4,3-a][1,4]benzodiazepine or the pharmacologically acceptable acid addition salt or a (5) N-oxide thereof in association with a pharmaceutical carrier.

4,508,727

ANTIHYPERTENSIVE 2-OXO-IMIDAZOLIDINE DERIVATIVES

Naoto Yoneda, Suita; Jyoji Kato, Yawata; Kimiaki Hayashi, Suita; Takashi Ochiai, Kobe, and Keizo Kinashi, Yao, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

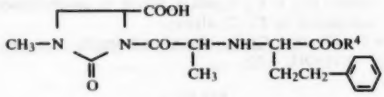
Filed May 24, 1983, Ser. No. 496,877

Claims priority, application Japan, May 24, 1982, 57-88637

Int. Cl.[3] **A61K** *31/415;* **C07D** *233/38*

U.S. Cl. 514—398 **9 Claims**

7. A method of producing a hypotensive effect on a warm-blooded animal comprising administering to said warm-blooded animal an effective amount of a compound of the formula:



wherein R^4 is lower alkyl, or a pharmaceutically acceptable salt thereof.

4,508,728

METHOD OF TREATING INFLAMMATORY DISEASES

Kineshiro Nagai, and Kinuko Nagai, both of No. 4-22-2, Yoyogi, Shibuya-ku, Tokyo, Japan

Filed May 24, 1984, Ser. No. 613,230

Int. Cl.[3] **A61K** *31/415*

U.S. Cl. 514—400 **5 Claims**

1. A method of treating inflammatory disease selected from the group consisting of wounds of all sorts, dental extraction wounds, aphtha ulcer, angulus infectiosus allergic rhinitis, tonsillitis, inflammation of respiratory tract, burn, herpes zoster, decubital ulcer, eczema, allergic dermatitis, geriatic itchness, stomach ulcer, ulcer of the duodenum, ulcers of the small and large intestines and the rectum, hemorrhoid, ulcer of the anus, cervical erosion, vaginal ulcer, ulcer of the outer genitalia, herpes and asthma in a human suffering therefrom comprising administering a preparation comprising homocarnosine or a physiologically acceptable salt thereof in an effective amount for treating the inflammatory disease in said human.

4,508,729

SUBSTITUTED IMINODIACIDS, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Michel Vincent, Bagneux; Georges Remond, Versailles, and Michel Laubie, Vaucresson, all of France, assignors to Adir, Neuilly-sur-Seine, France

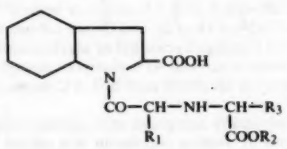
Continuation-in-part of Ser. No. 212,607, Dec. 3, 1980, Pat. No. 4,404,206. This application Oct. 2, 1981, Ser. No. 308,234

Claims priority, application France, Oct. 2, 1980, 80 21095; Apr. 7, 1981, 81 06916

Int. Cl.[3] **C07D** *209/34;* **A61K** *31/405*

U.S. Cl. 514—419 **7 Claims**

1. A compound selected from the group consisting of iminodiacid compounds having the formula:



wherein

R_1 represents lower-alkyl having 1 to 4 carbon atoms, inclusive,

R_2 represents hydrogen or lower-alkyl having 1 to 4 carbon atoms, inclusive,

R_3 is $—CH_2CH_2—CH_3$, in racemic form or as an optical isomer, a salt thereof with a pharmaceutically-acceptable inorganic or organic base, and an addition salt thereof with a pharmaceutically-acceptable inorganic or organic acid.

4,508,730

1,7-DIHYDRO-PYRROLO[3,4-e][1,4]DIAZEPIN-2(3H)-ONE DERIVATIVES A PROCESS FOR PREPARING THEM AND THEIR USE AS ANTICONVULSANT AND ANTI-ANXIETY AGENTS

Luigi Mariani, and Giorgio Tarzia, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Italy

Filed Aug. 9, 1983, Ser. No. 521,774

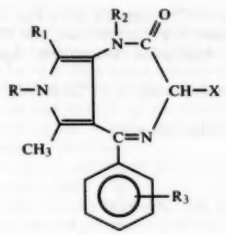
Claims priority, application United Kingdom, Sep. 8, 1982, 8225582

The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.

Int. Cl.[3] **A61K** *31/55;* **C07D** *487/04*

U.S. Cl. 514—218 **10 Claims**

1. A 1,7-dihydro-pyrrolo[3,4-e][1,4]diazepin-2-(3H)-one of following formula I



I

wherein

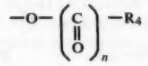
R represents methyl, ethyl, propyl, 1-methylethyl, butyl, 1-methylpropyl, 2-methylpropyl and 1,1-dimethylethyl

R_1 stands for hydrogen, methyl, ethyl, phenyl, chloro, bromo or nitro

R_2 is hydrogen, methyl, ethyl, propyl, 1-methylethyl, butyl, 1-methylpropyl, 2-methylpropyl and 1,1-dimethylethyl

R_3 represents hydrogen, chloro, fluoro, bromo, trifluoromethyl and methoxy, and

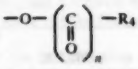
X is



or —NH—R_4 wherein n is 0 or 1 and

R_4 represents a straight or branched alkyl or alkenyl group which may contain up to 12 carbon atoms, which may be unsubstituted or substituted with one or more groups independently selected from (C_{1-4})alkoxy, halogen, carboxy, carbo-(C_{1-4})alkoxy, amino, mono- or di-(C_{1-4})alkylamino, (C_{2-4})alkanoylamino, benzoylamino, phthalimido, carbamyl, (C_{1-4})alkylcarbamyl, carboxy-(C_{1-4})alkylcarbamyl, carbalkoxy-(C_{1-4})alkylcarbamyl, and phenylcarbamyl, a (C_{5-8})cycloalkyl group which may be unsubstituted or substituted with one or two groups independently selected from (C_{1-4})alkyl, hydroxy, halogen, carboxy, and carbo-(C_{1-4})alkoxy, or a phenyl group which may be unsubstituted or substituted with 1 to 3 groups independently selected from (C_{1-4})alkyl, hydroxy, halogen, carboxy, and carbo(C_{1-4})alkoxy, or a phenyl group

which may be unsubstituted or substituted with 1 to 3 groups independently selected from (C_{1-4})alkyl, (C_{1-4})alkoxy, (C_{3-8})cycloalkyl, amino, mono- or di-(C_{1-4})alkylamino, phenyl, trifluoromethyl and halogen with the proviso that when simultaneously R_1 is hydrogen, methyl, ethyl or phenyl and X is an



group wherein n is 1, R_4 cannot represent methyl; and the pharmaceutically acceptable acid addition salts thereof.

8. A method of treating anxiety or convulsions by the administration of an anti-anxiety or anticonvulsant amount of a compound of claim 1 to a patient in need thereof.

4,508,731

MICROBICIDAL N-(TETRAHYDRO-2-ON-FUR-3-YL)-N-SUBSTITUTED ACETYL-ANILINES AND -NAPHTHYLAMINES

Peter Riebli, Basel; Hanspeter Fischer, Bottmingen; Rudolph C. Thummel, Courgenay, and Adolf Hubele, Magden, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

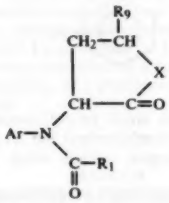
Division of Ser. No. 370,759, Apr. 22, 1982, Pat. No. 4,448,773. This application Feb. 13, 1984, Ser. No. 579,230

Claims priority, application Switzerland, Apr. 29, 1981, 2783/81

Int. Cl.[3] **A01N** *43/08, 43/10;* **C07D** *307/30, 309/28*

U.S. Cl. 514—472 **11 Claims**

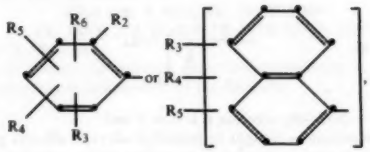
1. A compound of the formula I



(I)

wherein

Ar is a group of the formula



R_1 is 2-furyl, 2-tetrahydrofuryl, C_2–C_4-alkenyl, cyclopropyl, β-$(C_1$–$C_4)$-alkoxyethyl or $-CH_2Z$, each being unsubstituted or substituted by halogen, and Z being

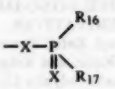
(a) —OH,

(b) —1H-1,2,4-triazolyl, 1-imidazolyl or 1-pyrazolyl,

(c) $-S(O)_n-R_{13}$, where R_{13} is C_1–C_4-alkyl, and n is 1 or 2,

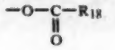
(d) $-X-R_{14}$, where X is oxygen or sulfur, and R_{14} is C_1–C_6-alkyl, C_3–C_4-alkenyl or C_3–C_4-alkynyl, each unsubstituted or substituted by C_1–C_2-alkoxy,

(e) $-OSO_2-R_{15}$, where R_{15} is C_1–C_4-alkyl, or mono- or di-$(C_1$–$C_3)$-alkylamine,



(f)

where X is oxygen or sulfur, R_{16} is C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkylamino, and R_{17} is C_1–C_4-alkoxy or C_1–C_4-alkylamino, or

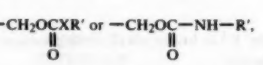


(g)

where R_{18} is C_1–C_3-alkyl which is unsubstituted or substituted by C_1–C_2-alkoxy,

R_2 is C_1–C_3-alkyl, C_1–C_3-alkoxy or halogen,

R_3 is $-CH_2OH$, $-N_3$,



where R′ is C_1–C_6-alkyl or C_2–C_4-alkenyl, each unsubstituted or substituted by halogen or C_1–C_3-alkoxy, or it is phenyl substituted by chlorine and X is oxygen or sulfur,

R_4 is hydrogen, C_1–C_3-alkyl, C_1–C_3-alkoxy, halogen, $-NO_2$ or $-NH_2$,

R_5 is hydrogen or C_1–C_3-alkyl,

R_6 is hydrogen or C_1–C_3-alkyl,

R_9 is hydrogen or methyl,

X is oxygen or sulfur.

6. A composition for combating and/or preventing an infestation by harmful microorganisms, which composition contains as active ingredient at least one active substance according to claim 1 and an inert carrier.

4,508,732

BASIC ETHERS USEFUL AS ANTIDEPRESSANT AGENTS

Hans-Heinrich Hausberg, Weiterstadt; Helmut Prücher, Heppenheim; Jürgen Uhl, Seeheim; Christoph Seyfried, Seeheim-Jugenheim, and Klaus Minck, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

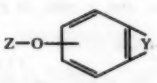
Division of Ser. No. 216,454, Dec. 15, 1980, Pat. No. 4,376,123. This application Jan. 21, 1983, Ser. No. 459,928

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950135

Int. Cl.[3] **A61K** *31/36, 31/135;* **C07C** *93/14*

U.S. Cl. 514—466 **7 Claims**

1. A basic ether of the formula



wherein Z is CH_3—NR^2—CH_2CH_2—CHR^1—; R^1 is cyclopropyl or Ar; R^2 is H, alkyl of 1–4 C atoms, alkenyl of 2–4 C atoms, cycloalkylalkyl of 4–8 C atoms or benzyl; Y is —CH$_2$—CHQ^1—CHQ^2—CO—; Q^1 and Q^2 are independently each H, alkyl of 1–4 C atoms, cycloalkyl or alkylcycloalkyl each of 3–6 total C atoms or Ar; and Ar is phenyl or phenyl substituted by F, Cl, alkoxy or alkylthio, each of 1–4 C atoms, methylenedioxy or CF_3;

or a physiologically acceptable acid addition salt thereof.

7. A method of treating depression in a patient in need of such treatment comprising administering to the patient an antidepressantly effective amount of a compound of claim 1.

4,508,733

DRUG FOR STIMULATING HEPATIC CELL HOMEOSTASIS AND FOR RESTORING THE FUNCTIONAL CAPACITY OF THE HEPATOCYTES

René Moreuil, Paris, France, assignor to Arconthorn Limited, London, England

Filed Nov. 4, 1982, Ser. No. 439,181
Int. Cl.³ A61K *31/185*; C07C *143/02*
U.S. Cl. 514—578 **4 Claims**

1. A method for stimulating hepatic cell homeostasis which comprises administering to a host an effective amount of aminoethanethiosulphonic acid having the formula:

or a pharmaceutically acceptable salt thereof.

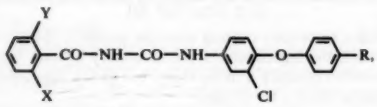
4,508,734

SUBSTITUTED N-BENZOYL-N-PHENOXYPHENYLUREAS, THE MANUFACTURE, AND THE USE THEREOF FOR COMBATING INSECTS

Arno Lange, Mannheim; Karl Kiehs, Lampertheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,667
Int. Cl.³ A01N *47/34*; C07C *127/22*
U.S. Cl. 514—594 **5 Claims**

1. A substituted N-benzoyl-N'-phenoxyphenylurea of the formula



(I)

where X and Y denote fluorine or chlorine and R denotes fluorine, chlorine or bromine.

5. A process for combating insects which comprises: allowing an insecticidally effective amount of an N-benzoyl-N'-phenoxyphenylurea of the formula I as set forth in claim 1 to act on the insects, their eggs and/or their habitat.

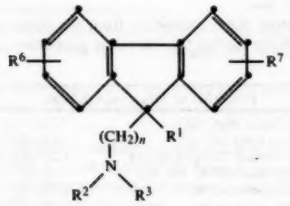
4,508,735

ANTI-ARRHYTHMIC N-ALKANOYLAMINOALKYL FLUORENES

William B. Lacefield, and Terry D. Lindstrom, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 21, 1983, Ser. No. 534,519
Int. Cl.³ C07C *103/28*; A61K *31/165*
U.S. Cl. 514—616 **20 Claims**

1. An N-alkanoylaminoalkylfluorene of the formula



wherein:

R^1 is hydroxy, cyano, $CONR^4R^5$ or $COOR^4$, in which R^4 and R^5 independently are hydrogen or C_1–C_6 alkyl;

n is 3, 4 or 5;

R^2 is hydrogen, C_1–C_6 alkyl, CH_2C_2–C_5 alkenyl or phenyl-C_1–C_3 alkyl;

R^3 is C_1–C_6 alkanoyl; and

R^6 and R^7 independently are hydrogen, C_1–C_4 alkyl or halogen.

16. A method of treating cardiac arrhythmias comprising administering to a subject an antiarrhythmic amount of a compound of claim 1.

4,508,736

METHOD FOR PREPARING IMPROVED QUALITY RICE-CONTAINING BAKED PRODUCTS

Maura M. Bean; Kazuko D. Nishita, both of Berkeley, and Elizabeth A. Hoops, San Jose, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 24, 1982, Ser. No. 423,404
Int. Cl.³ A21D *8/02*
U.S. Cl. 426—19 **4 Claims**

1. A method for preparing improved quality rice-containing chemically-leavened or yeast-leavened baked products wherein all or most of the wheat flour in the baking formulation has been replaced with rice flour, which comprises the steps of:

(a) mixing rice flour having an amylose content below 20% and a low gelatinization temperature with an amount of water and for a time sufficient to wet all the particles;

(b) holding the rice flour-water mixture at a temperature of about −25° C. to 77° C. for a period sufficient to hydrate the particles and insufficient to cause undesirable microbial growth in the mixture or cause undersirable heat deterioration of the flour;

wherein steps (a) and (b) are performed in the absence of added sugar; and

wherein the intensity of the mixing of step (a) and the holding time and temperature of step (b) are interrelated as follows:

if the mixing of step (a) is vigorous, the minimum holding time is shorter than for a simple blending; and for a given mixing intensity, the minimum holding time is longer at the lower temperatures than at the higher temperatures;

(c) mixing the treated rice flour of step (b) into a baking formulation; and

(d) baking the formulation of step (c).

4,508,737

METHOD FOR PRESERVING SILAGE AND RELATED COMPOSITIONS

Joseph G. Forest, Waverly, and Edward J. Czarnetzky, Chazy, both of N.Y., assignors to International Stock Food Corporation, Waverly, N.Y.

Continuation of Ser. No. 344,693, Feb. 1, 1982, abandoned, which is a continuation of Ser. No. 233,261, Feb. 10, 1981, abandoned, which is a continuation of Ser. No. 116,730, Jan. 30, 1980, abandoned, which is a continuation of Ser. No. 852,645, Nov. 18, 1977, abandoned. This application Nov. 16, 1983, Ser. No. 551,518
Int. Cl.³ A23K *1/00*
U.S. Cl. 426—54 **8 Claims**

1. A process for preserving and controlling the fermentation of silages and high moisture content grains comprising mixing with fresh silages and/or grains a composition comprising a compound selected from the group consisting of alkali metal sulfite, alkali metal bisulfite, alkali metal metabisulfite or mixtures thereof, said compound being present in the resulting silage and/or grain mixture in an amount of 0.2 to 1.5 lbs/ton silage and sufficient to provide a substantially anaerobic atmosphere in the silage and/or grain, said amount being insufficient

to destroy substantial amounts of the natural bacteria which are present in the fresh silage and/or grain and which take part in fermentation.

4,508,738

NON-SUCROSE FERMENTING *PEDIOCCUS PENTOSACEUS*

Carlos F. Gonzalez, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed Mar. 17, 1982, Ser. No. 359,164

Int. Cl.[3] **A23B** *4/12;* **A23L** *1/31;* **C12P** *7/56;* **C12N** *15/00, 1/20, 1/00;* **C12R** *1/01*

U.S. Cl. 426—55 **23 Claims**

1. A storage stable biologically pure strain of *Pediococcus pentosaceus* adapted for food fermentations which strain is unable to ferment sucrose to lactic acid as a result of curing removal of a single naturally occurring plasmid from a known strain of *Pediococcus pentosaceus,* wherein the single plasmid removed corresponds in size and in control of sucrose fermentation to a single plasmid in *Pediococcus pentosaceus* NRRL-B-11,465, and which strain with the plasmid removed is able to ferment dextrose to lactic acid in a food.

8. In the method for preparation of fermented foods by providing a culture in the foods and then fermenting the foods the improvement which comprises: providing in the foods a strain of *Pediococcus pentosaceus* which is unable to ferment sucrose to lactic acid as a result of curing removal of a single naturally occurring plasmid from a known strain of *Pediococcus pentosaceus,* wherein the single plasmid removed corresponds in size and in control of sucrose fermentation to a single plasmid in *Pediococcus pentosaceus* NRRL-B-11,465, wherein the fermentation is conducted in the presence of dextrose which is fermented to produce lactic acid which lowers pH of the food.

4,508,739

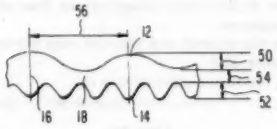
POTATO PRODUCT WITH OPPOSITE CORRUGATIONS OF DIFFERENT FREQUENCIES

Philip J. Ryan, Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Dec. 7, 1982, Ser. No. 447,643

Int. Cl.[3] **A23L** *1/212, 1/216;* **A23P** *1/00*

U.S. Cl. 426—144 **7 Claims**



1. A food product comprising:

a potato slice or potato dough sheet having corrugations on opposite surfaces thereof,

the corrugations on one surface having a frequency in the range from 1.5 to 5 times the frequency of the corrugations on the opposite surface, and

said slice or sheet having the capability of being cooked differentially in different thickness portions thereof.

4,508,740

TABLETTED BEVERAGE COMPOSITION CONTAINING DIPEPTIDE SWEETENER AND PROCESS THEREFORE

Daniel R. McSweeney, Plainsboro, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,805

Int. Cl.[3] **B27J** *5/00;* **A23L** *2/00, 1/275, 1/236*

U.S. Cl. 426—250 **9 Claims**

1. An improved process for preparing a nonfriable, tableted beverage mix comprising a dipeptide sweetener, colorant, flavor and edible acidulent by compressing a moistened mixture of these components comprising the steps of:

(a) preparing a uniform dry mix comprising a dipeptide sweetener, an acidulent, a hydrophilic material and a colorant;

(b) admixing with the dry mix a moistener consisting of water, propylene glycol or ethyl alcohol, monocalcium phosphate, and glycerine or a glycerine derivative;

(c) adding a sufficient amount of a disintegrant to convert the mixture of step (b) into a tabletable mixture;

(d) compressing the tabletable mixture to the extent necessary to obtain a coherent tablet which has a tablet density, after drying, of from 0.5 to 1.0 grams per cubic centimeter; and, thereafter,

(e) drying the tablet to a stable moisture content of less than about 1% by weight.

4,508,741

COATED PET FOOD AND PROCESS FOR PREPARATION THEREOF

Colin D. Corbett, El Paso, Tex.; Robert L. Milloch, Garden Grove, and Felicisimo S. Sarno, Cerritos, both of Calif., assignors to Star-Kist Foods, Inc., Terminal Island, Calif.

Filed Sep. 15, 1982, Ser. No. 418,239

Int. Cl.[3] **A23K** *1/00*

U.S. Cl. 426—303 **14 Claims**

1. A process for preparing a dry pet food product, comprising the steps of:

forming an edible core, the core including at least some farinaceous material;

applying a primary coating to the core, the primary coating having a proteinaceous component in an amount less than 50 percent of the total dry weight of the primary coating; and

applying a secondary coating over the primary coating on the core, the ingredients of the secondary coating being selected to produce a moist shiny and glossy appearance on the product after drying.

4,508,742

TREATING BEER TO PREVENT CHILL HAZE AND METAL CONTAMINATION

John R. McLaughlin, Media, Pa., and Elliot P. Hertzenberg, Wilmington, Del., assignors to PQ Corporation, Valley Forge, Pa.

Filed May 6, 1983, Ser. No. 492,314

Int. Cl.[3] **C12H** *1/04;* **C01B** *33/24;* **C10M** *7/02*

U.S. Cl. 426—330.4 **11 Claims**

1. A method of treating beer to prevent chill haze while averting metal contamination of the beer comprising the steps of:

(a) contacting said beer with a combination of an inorganic chill-proofing agent and 0.2 to 6 pbw (parts by weight) of a porous, amorphous magnesium silicate for each 100 pbw of chill-proofing agent;

(b) maintaining said contact for a time sufficient for said combination to adsorb the components of chill haze from the beer; and

(c) separating the combination from the beer, said magnesium silicate having the following properties:

Properties of Magnesium Silicate	
Mole Ratio $MgO:SiO_2$	1:1.6 to 4.7
Surface Area (M^2/g)	30 to 600
Bulk Density Tamped (g/cc)	0.25 to 0.75
Weight loss 105° C. (wt %)	5 to 20
Ignition loss (wt %)	10 to 35
pH 5% wt in water	8.5 to 10.5

4,508,743

CAFFEINE ADSORPTION

David Green, Chavornay, and Maurice Blanc, Morges, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 153,904, May 28, 1980,. This application May 15, 1981, Ser. No. 264,062

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.³ A23F 5/22

U.S. Cl. 426—422 3 Claims

1. A process for the removal of caffeine from green coffee beans which comprises contacting the beans with an aqueous medium selected from the group consisting of water, an aqueous solution of non-caffeine green coffee solids and an aqueous solution of non-caffeine green coffee solids containing a minor amount of caffeine, recovering aqueous medium containing caffeine dissolved from the green coffee beans, removing caffeine from the medium by contact with substantially neutral activated carbon, separating the activated carbon with caffeine adsorbed thereon from aqueous medium of reduced caffeine content and combining non-caffeine green coffee solids present in the aqueous medium of reduced caffeine content with green coffee beans having a reduced content of caffeine and of non-caffeine green coffee solids, the ratio of aqueous medium to green coffee beans being 3:1 to 15:1.

4,508,744

BEVERAGE CLOUDING AGENT BASED ON CARNAUBA WAX

Albert J. Kruger, Jr., Altamonte Springs, Fla., and John K. Johnson, Decatur, Ga., assignors to The Coca Cola Company, Atlanta, Ga.

Filed Jun. 15, 1983, Ser. No. 504,457

Int. Cl.³ A23L 2/00

U.S. Cl. 426—590 23 Claims

1. An edible clouding agent which comprises finely divided carnauba wax particles in an emulsion base comprising water, a water-soluble gum, a polyhydric alcohol of two to six carbons, and an edible salt, wherein the size of the wax particles is characterized by an interfacial area of 12.5 m^2/cm^3 to 15.0 m^2/cm^3, wherein the weight ratio of wax to salt is about 1:2 to 2:3, and the weight ratio of wax to alcohol is about 1:4 to 1:3.

4,508,745

PRODUCTION OF A MANNAN OLIGOMER HYDROLYSATE

Charles V. Fulger, Millwood; Howard D. Stahl, Scarsdale, both of N.Y.; Evan J. Turek, Paramus, N.J., and Renee Bayha, Mahopac, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,914

Int. Cl.³ A23F 5/24

U.S. Cl. 426—594 14 Claims

1. A method of hydrolyzing a coffee extraction residue material to produce mannan oligomers from DP 1 to about DP 10 said coffee extraction residue material comprising coffee grounds that have been atmospherically extracted and then thermally hydrolyzed to remove most of the arabinogalactan therefrom, said method comprising:

(a) slurrying the coffee extraction residue material in a liquid to between 5% and 60% by weight dry basis, residue material;

(b) adding an acid catalyst to the slurry in an amount sufficient to adjust the pH of said slurry to between pH 0.5 and pH 4;

(c) feeding the slurry through a reactor at a temperature between 160° C. and 260° C. in from 6 seconds to 60 seconds at a pressure between 6 atmospheres and 35 atmospheres to hydrolyze the mannan;

(d) discharging the slurry from the reactor through an orifice so that the pressure is rapidly reduced to atmospheric, quenching the hydrolysis reaction;

(e) neutralizing the discharged slurry; and

(f) separating hydrolyzed coffee extraction residue material from the mannan oligomers from DP 1 to about DP 10 to produce mannan oligomers of a purity in excess of 80%.

8. A method of hydrolyzing a coffee extraction residue material to produce mannan oligomers from DP 1 to about DP 10 said coffee extraction residue material comprising coffee grounds that have been atmospherically extracted and then thermally hydrolyzed to remove most of the arabinogalactan therefrom, said method comprising:

(a) slurrying the coffee extraction residue material in a liquid to between 5% and 60% by weight dry basis, residue material;

(b) reacting the slurry in a reactor at a temperature between 160° C. and 260° C. for from 6 seconds to 60 seconds while simultaneously injecting carbon dioxide into the reactor as an acid catalyst so that the pH is less than about pH 4;

(d) discharging the slurry from the reactor through an orifice so that the pressure is rapidly reduced to atmospheric, rapidly quenching the hydrolysis reaction; and

(e) separating hydrolyzed coffee extraction residue material from the mannan oligomer solution having oligomers from DP 1 to about DP 10 to produce mannan oligomers of a purity in excess of 80%.

4,508,746

LOW CALORIE EDIBLE OIL SUBSTITUTES

Donald J. Hamm, New Providence, N.J., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Jun. 20, 1983, Ser. No. 506,234

Int. Cl.³ A23D 5/00

U.S. Cl. 426—601 2 Claims

1. A method for reducing the available calories in a food composition having an edible oil component, which method consists of replacing at least a substantial portion of the edible oil in such food composition with at least one low calorie substitute consisting of tricarballylic acid esterfied with saturated or unsaturated alcohols having straight or branched carbon chains of from 8 to 30 carbon atoms.

4,508,747

AROMATIC CITRUS OIL CONCENTRATE WHICH IS STABLE IN STORAGE

Erich Ziegler, Draisendorfer Strasse 143, D-8551 Aufsess, Fed. Rep. of Germany

Division of Ser. No. 362,893, Mar. 26, 1982, Pat. No. 4,435,437. This application Oct. 6, 1983, Ser. No. 539,672

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112380

Int. Cl.³ A23L 1/221, 1/28

U.S. Cl. 426—651 4 Claims

4. A process for producing a concentrate of natural citrus oil which retains its aroma and is stable in storage comprising: forming a mixture containing 10 to 95 percent by weight citrus peel oil concentrate and the remainder being one or more ingredients selected from the group consisting of essence oil concentrate and concentrate of an aqueous essence, wherein the peel oil concentrate is obtained by extracting the cold-pressed citrus peel oil with a polar organic solvent to form a solvent extract phase and a raffinate phase, separating the solvent extract phase from the raffinate phase, and separating oil concentrate from the separated solvent extract phase.

4,508,748

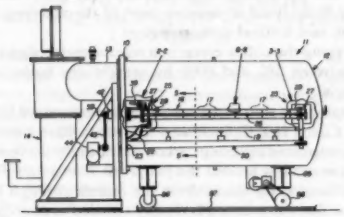
MANUFACTURING PROCESS FOR SELENIUM PHOTORECEPTORS

Richard C. Eriksson, Kingston, Mass., assignor to XIS, Incorporated, W. Groton, Mass.

Division of Ser. No. 455,828, Jan. 5, 1983,. This application Feb. 13, 1984, Ser. No. 579,550

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—8 **11 Claims**



1. A vacuum deposition method comprising the following steps:

providing a vacuum chamber;

disposing within said chamber a plurality of substrate electrode units to be coated;

reducing the pressure within said vacuum chamber;

establishing between said electrode units an electrical potential gradient that produces a glow discharge therebetween and resultant heating thereof;

sensing the temperature of said electrode units produced by said glow discharge heating thereof;

evaporatively coating said electrode units after a predetermined electrode unit temperature is produced by said glow discharge heating and sensed during said sensing step; and

removing said coated electrode units from said vacuum chamber.

4,508,749

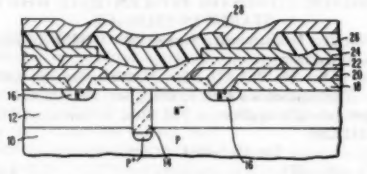
PATTERNING OF POLYIMIDE FILMS WITH ULTRAVIOLET LIGHT

James H. Brannon, Wappingers Falls, and John R. Lankard, Sr., Mahopac, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,566

Int. Cl.³ B44C *1/22;* **C03C** *25/06, 15/00;* **B05D** *3/06*

U.S. Cl. 427—43.1 **34 Claims**



28. A method for forming a multilayer metallurgy structure for circuit interconnections comprising:

providing a substrate having a first circuit pattern of metallurgy thereon;

forming a polyimide layer over said circuit pattern in sufficient thickness to act as a dielectric layer;

directing U.V. radiation having a wavelength between about 240 to 400 nm. through a mask having a desired interlayer opening pattern;

projecting said pattern of U.V. radiation through a suitable optical system and imaging onto said polyimide layer;

continuing the exposure of said polyimide layer to said pattern of U.V. radiation until said layer has been etched through to said pattern of metallurgy with said openings each having sidewalls with a positive slope; and

forming a second circuit pattern of metallurgy on the remaining polyimide layer and through said interlayer opening pattern to electrical interconnect the said first and second patterns of metallurgy.

4,508,750

PROCESS FOR CROSSLINKING LACQUERS WHICH ARE BASED ON PLASTICS AND HAVE BEEN APPLIED TO BASE MATERIALS

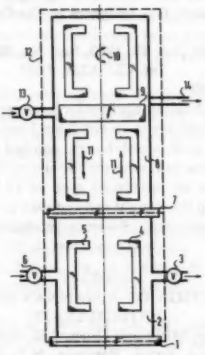
Eberhard Föll, Nehren; Peter Holl, and Helmut Vetter, both of Tübingen, all of Fed. Rep. of Germany, assignors to 501 Polymer-Physik GmbH & Co., Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 239,039

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010821

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—44 **5 Claims**



1. A method of cross-linking a lacquer coating applied to an article, said lacquer being of the type curable by ionizing radiation in an inert atmosphere comprising:

(a) providing an article in a gas lock chamber, said chamber comprising a gate lock;

(b) evacuating said gas lock chamber;

(c) flooding inert gas into said gas lock chamber to normal pressure;

(d) opening said lock gate;

(e) moving said article directly from said gas lock chamber through said lock gate and into an irradiation chamber, said article bearing a coating of said lacquer, said irradiation chamber containing an inert gas atmosphere at normal pressure;

(f) irradiating the coated article with ionizing radiation in said radiation chamber to cross link said lacquer;

(g) moving the irradiated article back through said lock gate directly into said gas lock chamber, said gas lock chamber containing inert gas at normal pressure;

(h) closing said lock gate; and

(i) removing said article from said gas lock chamber.

4,508,751

PROCESS FOR THE PREPARATION OF HIGHLY SIZED PAPER

Shigehisa Tamagawa, and Tetsuro Fuchizawa, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 24, 1983, Ser. No. 478,257
Claims priority, application Japan, Mar. 26, 1982, 57-48244
Int. Cl.[3] B05D 3/06
U.S. Cl. 427—44 10 Claims

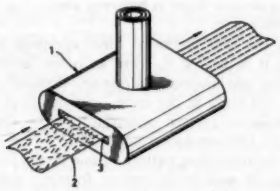
1. A process for the preparation of a sized paper resistant to permeation of water, an alkaline solution and an organic solvent which comprises subjecting a paper containing sodium stearate in combination with aluminum sulfate to electron radiation in such a manner that the dosage of the electron radiation absorbed by the paper reaches a range of 0.5 to 30 megarads.

4,508,752

METHOD FOR MANUFACTURING A MAGNETIC RECORDING MEDIUM

Yutaka Takei, and Masashi Somezawa, both of Sendai, Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP82/00209, § 371 Date Jan. 28, 1983, § 102(e) Date Jan. 28, 1983, PCT Pub. No. WO82/04343, PCT Pub. Date Dec. 9, 1982
Continuation of Ser. No. 464,496, Jan. 28, 1983, abandoned. This PCT application May 28, 1982, Ser. No. 634,183
Claims priority, application Japan, May 28, 1981, 56-81296
Int. Cl.[3] H01F 10/00; B05D 5/12
U.S. Cl. 427—48 5 Claims



1. A method for manufacturing a magnetic recording medium, comprising the steps of coating a magnetic paint consisting mainly of a needle-like magnetic powder and a binder on a nonmagnetic support to form a coating film; establishing a DC magnetic field of a predetermined direction in a slot about which a superconductive solenoid coil is formed, said coil having substantially zero electrical resistance by being exposed to an extremely low temperature, passing said nonmagnetic support with the magnetic paint thereon while said needle-like magnetic powder is still mobile through said slot, said DC magnetic field having an intensity of 1.5 to 15 kOe and is applied for at least 100 msec, thereby orienting said needle-like magnetic powder in said predetermined direction; and drying said coating film.

4,508,753

METHOD OF PRODUCING FINE LINE CONDUCTIVE/RESISTIVE PATTERNS ON AN INSULATING COATING

William E. Stepan, Clarendon Hills, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Aug. 19, 1982, Ser. No. 409,672
Int. Cl.[3] B05D 5/12
U.S. Cl. 427—53.1 12 Claims

1. The method of forming a fine line circuit on an insulating coating comprising the steps of:

bonding said insulating coating on a substrate surface;

forming an engraved circuit pattern on a surface of said insulating coating by directing engraving means to remove selected portions of said insulating material;

applying a circuit medium over said engraved circuit pattern;

wiping said circuit medium off of said insulating coating surface leaving said engraved circuit pattern filled with said circuit medium; and

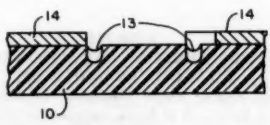
heating said insulating coating and substrate to cause said circuit medium to be sintered to said insulating coating and establishing said circuit pattern.

4,508,754

METHOD OF ADDING FINE LINE CONDUCTIVE/RESISTIVE PATTERNS TO A THICK FILM MICROCIRCUIT

William E. Stepan, Clarendon Hills, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Aug. 19, 1982, Ser. No. 409,673
Int. Cl.[3] B05D 5/12
U.S. Cl. 427—53.1 6 Claims



1. The method of adding fine line circuits to a thick film microcircuit comprising the steps of;

providing a dielectric substrate surface;

forming an engraved circuit pattern on said dielectric substrate surface by directing engraving means to cut and remove selected portions of said dielectric substrate surface;

applying a circuit medium over said engraved pattern;

wiping said circuit medium off of said dielectric substrate surface leaving said engraved pattern filled with said circuit medium;

screen printing thick film circuit elements on said dielectric substrate surface and over selected portions of said engraved circuit pattern; and

heating said substrate, to cause said circuit medium and said thick film elements to be sintered to said substrate establishing said thick film microcircuit.

4,508,755

METHOD OF APPLYING A LAYER OF CONDUCTIVE INK

Anthony B. Reintjes, Dorchester; Robert J. Fleming, St. Thomas, and Bev W. T. Gumb, London, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 30, 1983, Ser. No. 480,217
Int. Cl.[3] B05D 5/12; B41F 17/00
U.S. Cl. 427—58 5 Claims

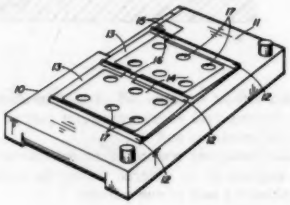
1. A method of applying a layer of conductive ink in a predetermined pattern on a plastic backplate of an electret transducer, said backplate having a non-planar front surface, a side edge, a recessed portion at one end and an end surface associated with said recess, said predetermined pattern extending into said recess comprising;

filling a recess in a die with conductive ink, the recess having a shape related to said predetermined pattern;

positioning said plastic backplate at a position relative to said recess in said die;

pressing a resilient ball-ended member on to said die, over said recess in said die;

pressing said ball-ended member on to said plastic backplate and deforming the ball end of the ball-ended member into



contact for the entire predetermined pattern on said non-planar surface, down said side edge into contact with a surface in said recess in the backplate, and into contact with said end surface, whereby the ink picked up by the ball end from said recess in said die is transferred to said non-planar surface, including said side edge, said surface in said recess in said backplate and said end surface.

4,508,756

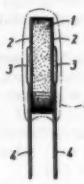
METHOD FOR INHIBITING OXIDATION OF A COPPER FILM ON CERAMIC BODY

Atsuo Senda, Ootsu; Tohru Kasanami, Otokuni, and Takuji Nakagawa, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 194,984, Oct. 8, 1980, abandoned. This application Jun. 17, 1982, Ser. No. 389,251

Int. Cl.³ B05D *1/18;* **C23C** *3/02, 13/02*

U.S. Cl. 427—81 **8 Claims**



8. A process of forming an electrode of a ceramic capacitor, comprising the steps of

preparing a dielectric ceramic body having a surface,

forming a copper film serving as an electrode on said surface of said dielectric body by electroless plating, vacuum evaporation, sputtering or ion plating, and

poisoning the catalytic activity of said copper film by temporarily subjecting the copper film formed on the surface of the ceramic body to an agent consisting of a hydrocarbon halide compound promptly after the step of forming the copper film on the ceramic body, wherein said hydrocarbon halide is at least one member selected from the group consisting of trichloroethylene, perchloroethylene, freon, chlorobenzene, methyl chloride, methylene chloride, chloroform and carbon tetrachloride, and removing said agent from said copper film, whereby said copper film has a measurably increased resistance to oxidation after removal of said agent, said increased resistance being a result of the action of said agent.

4,508,757

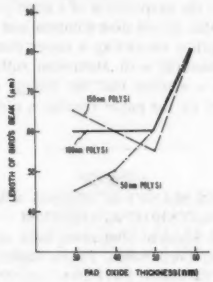
METHOD OF MANUFACTURING A MINIMUM BIRD'S BEAK RECESSED OXIDE ISOLATION STRUCTURE

Karen A. Fabricius, Newburgh, and Bernard M. Kemlage, Kingston, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1982, Ser. No. 450,883

Int. Cl.³ H01L *21/76*

U.S. Cl. 427—93 **9 Claims**



1. A method for manufacturing a monolithic integrated circuit structure comprising:

providing a monocrystalline silicon semiconductor body;

depositing onto said monocrystalline semiconductor body layers of silicon dioxide, polycrystalline silicon, and silicon nitride in that order;

said silicon dioxide layer is between about 2 to 10 nanometers in thickness;

patterning the said layers to form openings at the areas wherein it is desired to form an oxide isolation pattern within the said monocrystalline semiconductor body;

oxidizing said body at the same openings until the desired oxide isolation pattern penetrates to the desired depth within the semiconductor body; and

removing the remaining pattern of said layers following said oxidizing of said body before forming semiconductor devices in said body and between said oxide isolation pattern.

4,508,758

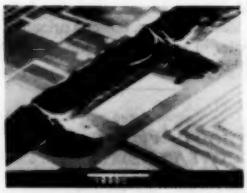
ENCAPSULATED ELECTRONIC CIRCUIT

Ching-Ping Wong, Lawrence Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,004

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—96 **8 Claims**



1. A method of encapsulating a hybrid circuit formed from a substrate having a plurality of circuit patterns contained thereon, comprising the steps of:

(a) mounting individual or discrete circuit devices on preselected areas of each circuit pattern;

(b) applying a first encapsulant composition having a yield point stress of from 2000 to 3200 dynes/cm^2 and a viscos-

ity of from 700,000 to 1.2×10^6 centipoise around the periphery of each circuit pattern on the substrate so as to form a wall or dam around each such circuit pattern, except for bonding pad areas used for making external connections to each of such circuits; and

(c) applying a second encapsulant within the wall so as to cover and encapsulate each circuit pattern and device mounted thereon, said second encapsulant being applied to a level such that it is retained within the wall.

4,508,759

METHOD AND APPARATUS FOR MAKING FRICTION LOCKING THREADED FASTENERS

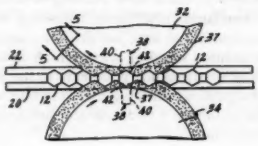
Richard B. Wallace, Bloomfield Hills, Mich., assignor to The Oakland Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 376,764, May 10, 1982, Pat. No. 4,428,981. This application Jan. 10, 1983, Ser. No. 456,569

The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.

Int. Cl.³ B05D *1/12*

U.S. Cl. 427—195 **11 Claims**



1. The method of making locking fasteners which comprises advancing a series of headed threaded fasteners on a pair of parallel belts spaced to support the fasteners with the heads thereof on the belts and with the threaded shanks extending downwardly below the belts, defining an application zone by providing nozzle means at the side of the path of advance of the threaded shanks, heating the fasteners prior to entry into the application zone to a temperature sufficient to fuse thermoplastic resin particles received on the shanks, applying a stream of thermoplastic resin particles through said nozzle means onto the shanks as they traverse the application zone, positively rotating the fasteners as they traverse the application zone at a rate sufficient to form an annular deposit of fused resin extending completely around the shanks of the fasteners and directing the stream of particles against the sides of the fasteners at an oblique angle to the axes thereof such that the deposit of friction material is primarily at the non-load bearing sides of the threads.

4,508,760

METHOD AND APPARATUS FOR MICROENCAPSULATION

Roger Olson, Clear Lake, Wis., and Ronald J. Versic, Dayton, Ohio, assignors to Nova Tran Corporation, Clear Lake, Mich.

Filed Jun. 10, 1983, Ser. No. 503,053

Int. Cl.³ B01J *13/02*; B05D *5/06, 5/12*

U.S. Cl. 427—213.34 **8 Claims**

1. A method for microencapsulating an electroluminescent phosphor with an extremely thin coating which comprises:

vaporizing a poly-para-xylylene,

pyrolyzing the resulting vapors to form reactive monomeric radicals,

passing said monomeric radicals to a vacuum deposition zone,

tumbling particles of an electroluminescent phosphor in said deposition zone,

sifting said particles during such tumbling to thereby maintain the original particle size distribution during deposition, and

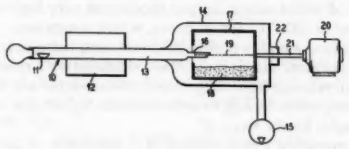
depositing said reactive monomeric radicals on said particles to cause said radicals to be adsorbed and polymerized into a coating on the surfaces of said particles.

7. An apparatus for encapsulating particles of an electroluminescent phosphor which comprises:

a vaporizing zone for vaporizing a poly-para-xylylene,

a pyrolysis zone connected to said vaporizing zone,

a rotary drum receiving reactive monomers formed in said pyrolysis zone, said rotary drum having discrete particles of said electroluminescent phosphor therein,



a vacuum chamber surrounding said drum and communicating with the interior of said drum,

a screen disposed within said drum to sift particles during rotation of said drum and tumbling of said particles, said screen having openings therein of a size arranged to maintain the original particle size distribution by the sifting action, and drive means for rotating said drum.

4,508,761

METHOD OF PREPARING POLYMER-COATED PARTICULATE INORGANIC MATERIAL

Takao Miyoshi, and Akira Sakanoue, both of Ube, Japan, assignors to Central Glass Company Limited, Ube, Japan

Filed Feb. 18, 1983, Ser. No. 467,839

Claims priority, application Japan, Feb. 19, 1982, 57-24292

Int. Cl.³ B05D *7/00*; B29J *5/00*

U.S. Cl. 427—221 **22 Claims**

1. A method of preparing a polymer-coated particulate graphite fluoride, comprising the steps of:

a. preparing a reaction system by dispersing from 1 to 100 parts by weight of graphite fluoride in the form of fine particles and from 0.1 to 100 parts by weight of at least one vinylic monomer capable of undergoing radical polymerization or radical copolymerization in a liquid medium comprised of 100 parts by weight of water and from 1 to 100 parts by weight of an organic solvent which is soluble in water, followed by adding to said liquid medium from 0.01 to 20% by weight, based on the weight of said at least one vinylic monomer, of a polymerization initiator for said at least one vinylic monomer;

b. adjusting the pH of said reaction system to a value in the range of from 5 to 9; and

c. allowing said at least one vinylic monomer to undergo polymerization or copolymerization and to bond to the surfaces of the particles of said graphite fluoride by graft Polymerization.

4,508,762

PROCESS FOR MANUFACTURING A HIGH-PERFORMANCE THERMAL PERFORMANCE MATERIAL

Gérard Rousseau, Gironde, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Apr. 29, 1983, Ser. No. 490,039
Claims priority, application France, Apr. 29, 1982, 82 07415
Int. Cl.[3] B05D 3/02, 3/12; B29C 25/00
U.S. Cl. 427—228 14 Claims

1. A process for manufacturing a thermal protection material capable of withstanding thermal shocks and very high temperatures up to 1000° C. for 10 hours, which comprises:

(1) forming a highly porous substrate comprising at least one of inorganic and organic fibers rigidified by a reinforcing resin selected from the group of thermostable and thermosetting resins having a carbon content higher than 45% by weight, by the steps of:

(a) preparing a first solution of a suspension of said fibers comprising a dispersant agent non-solvent of said resin and an emulsifying agent,

(b) preparing a second solution comprising a liquid form of said resin, said emulsifying agent, a solvent of said resin, said dispersant agent which is miscible with said solvent,

(c) mixing said first and second solutions until a homogeneous liquid phase is obtained.

(d) maintaining said phase for a period of time necessary so that the droplets of said resin collect and form on said fibers, thereby forming a film of said resin thereon,

(e) draining, drying and hardening the resulting material so as to form said substrate, and

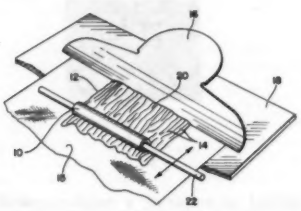
(2) subjecting said substrate, at least once, to the steps of pyrolyzing, coating and heating.

4,508,763

PROCESS AND PATTERN FOR DECORATING CYLINDRICAL ARTICLES

Kenneth L. Shemenski, Sprague ville Rd., Smithfield, R.I. 02917

Filed Sep. 6, 1983, Ser. No. 529,502
Int. Cl.[3] B05D 1/36
U.S. Cl. 427—262 8 Claims



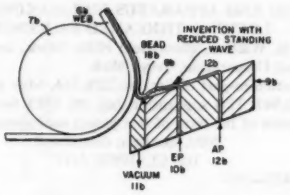
1. The process of lacquer decorating the outer surface of a metal generally cylindrically-shaped article such as a pen barrel, flashlight body, and the like comprising, coating said outer surface with a first lacquer, curing said first lacquer coat and thereafter decorating said surface with a second substantially similar lacquer of a substantially different color or shade than said first lacquer in a variegated pattern, said decorative pattern being applied by supporting said article for free rotation and thereafter lightly rolling said article in longitudinal contact with the upper surface of a patterning pad formed from a planar sheet of unpatterned, lint-free textile material which has been folded upon itself along a plurality of irregular longitudinally directed lines and wetted with said second lacquer coat so as to impart said variegated pattern to said article and thereafter immediately roll blotting said thus decorated article on a sheet of lacquer absorbent cloth and thereafter curing said second lacquer coat, wherein said first and second lacquers are melamine-alkyd resin mixtures.

4,508,764

COATING PROCESS EMPLOYS SURFACTANTS

Michael D. Zeldes, Hendersonville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 14, 1982, Ser. No. 449,744
Int. Cl.[3] B05D 3/00; G03C 1/76
U.S. Cl. 427—296 7 Claims



1. In a process of slide flow coating wherein a stream of silver halide emulsion flows onto a moving support or web under vacuum conditions and, just prior to contact, said stream of emulsion exhibits a standing wave which causes nonuniform coating, ribbing or streaking as defects in the coating the improvement comprising reducing said standing wave by incorporating in the emulsion a hydrocarbon surfactant in combination with a surfactant.

4,508,765

SYNTHETIC RESINS AND COATING COMPOSITIONS CONTAINING THEM

John Ring, Romford; David French, Walthamstow; Michael Hickling, Saffron Walden, and Michael G. Sturgess, Addington, all of England, assignors to International Paint public limited company, London, England

Filed Sep. 30, 1982, Ser. No. 429,983
Claims priority, application United Kingdom, Oct. 20, 1981, 8131611
Int. Cl.[3] C08L 61/14, 61/32, 62/00
U.S. Cl. 427—386 22 Claims

1. A heat-curable water-dispersible film-forming synthetic resin composition which is the reaction product of a water insoluble resin, selected from the group consisting of phenolic resins which are condensation products of a phenol and an aldehyde and amino resins which are formed by the reaction of a compound containing amine groups with an aldehyde, with an epoxy resin and from 0.5 to 15 percent by weight of a phosphoric acid based on the total synthetic resin in the composition, the weight ratio of the said water insoluble resin to the epoxy resin in the composition being from 1:20 to 2:1.

10. A process for the preparation of a heat-curable film-forming synthetic resin composition comprising reacting an epoxy resin with a water insoluble resin, selected from the group consisting of phenolic resins which are condensation products of a phenol and an aldehyde and amino resins which are formed by the reaction of a compound containing amine groups with an aldehyde, in a weight ratio of the said water insoluble resin to epoxy resin of 1:20 to 2:1 and with 0.5 to 15% by weight of a phosphoric acid based on the total synthetic resin in the composition, the reaction including a heating step at a temperature of at least 50° C. when the water insoluble resin and the epoxy resin are both present, to produce a water dispersible reaction product.

22. A process for coating a metal substrate comprising the steps of:

preparing a heat-curable water dispersible film-forming synthetic resin composition by reacting a water insoluble resin, selected from the group consisting of phenolic resins which are condensation products of a phenol and an alde-

hyde and amino resins which are formed by the reaction of a compound containing amine groups with an aldehyde, with an epoxy resin and from 0.5 to 15 percent by weight of a phosphoric acid based on the total synthetic resin in the composition, the weight ratio of said water insoluble resin to said epoxy resin in the composition being from 1:20 to 2:1; and dispersing the reaction product in a mainly aqueous continuous phase in the presence of a base which neutralizes at least partially the acidic phosphate groups of the synthetic resin and optionally a water-dispersible epoxy resin;

applying said composition to a metal substrate; and,

heating said composition at a temperature of from about 100° C. to about 240° C. for a period of time of from about 5 seconds to about 10 minutes to effect curing.

4,508,766

PROCESS FOR PRODUCING AROMATIC IMIDE POLYMER LAMINATE MATERIAL

Toshihiro Inaike, Chiba; Katsuhiko Ushimi, Ichihara; Shuji Yamamoto, Chiba, and Toshihiro Inoue, Ichihara, all of Japan, assignors to UBE Industries, Ltd., Chiba, Japan

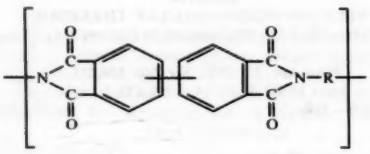
Filed Apr. 21, 1983, Ser. No. 487,140

Claims priority, application Japan, Apr. 30, 1982, 57-71546

Int. Cl.³ B05D 3/02

U.S. Cl. 427—388.2 **14 Claims**

1. A process for producing an aromatic imide polymer laminate material, comprising coating a surface of a metallic foil with a solution of at least one aromatic imide polymer comprising at least 90 molar% of at least one type of recurring unit of the formula (I):



(I)

wherein R represents a symmetrical bivalent aromatic radical having no substituent, and dissolved in a solvent consisting essentially of at least one phenolic compound; and heat evaporating said solvent from said aromatic imide polymer solution layer to form an aromatic imide polymer solid layer firmly bonded directly to said metallic foil.

4,508,767

PROCESS FOR FORMING A CORROSION RESISTANT COATING

Sadakazu Hokamura, Yamato; Toshio Shinohara, Yokohama; Mitsutoshi Aritomi, and Yuji Yoshida, both of Ibaraki, all of Japan, assignors to Dai Nippon Tokyo Co., Ltd, Osaka and Mitsubishi Yuka Fine Chemicals Co., Ltd., Tokyo, both of, Japan

Filed Nov. 30, 1983, Ser. No. 556,328

Claims priority, application Japan, Dec. 28, 1982, 57-229956; Dec. 28, 1982, 57-229957

Int. Cl.³ B05D 1/36

U.S. Cl. 427—407.1 **5 Claims**

1. A process for forming a moisture resistant coating film, which comprises:

(i) priming a coating composition on a substrate and drying it to form a prime coat;

(ii) coating thereon a radical-polymerizable and oxidation-polymerizable, room temperature solventless coating composition composed essentially of:

A. from 30 to 90% by weight of a resin component comprising (A) from 30 to 70% by weight of an oil-modified alkyd resin having an oil length of from 30 to 70% and modified with an α,β-unsaturated monocarboxylic acid selected from the group consisting of sorbic acid, crotonic acid and 2-(β-furyl)acrylic acid, the content of the α,β-unsaturated monocarboxylic acid in the alkyd resin being from 0.5 to 30% by weight, and (B) from 70 to 30% by weight of a polymerizable monomer in which the ingredient (A) is dissolved,

B. from 70 to 10% by weight of a scaly pigment, and

C. an effective amount of a curing catalyst, and polymerizing it to form a cured intermediate coat; and

(iii) coating thereon an air-drying finish coating composition and drying it to form a finish coat.

4,508,768

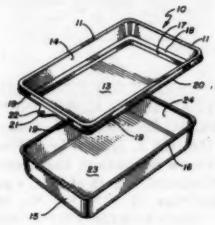
PROTECTIVE LINER FOR VESSELS

Edward B. Kornely, Two Rivers, and Gerald T. Paul, Manitowoc, both of Wis., assignors to Newell Companies, Inc., Manitowoc, Wis.

Filed Jul. 5, 1983, Ser. No. 510,948

Int. Cl.³ B65D 21/00

U.S. Cl. 428—35 **12 Claims**



1. A liner made of a thin film of flexible material for packaging and protecting the interior surfaces of a vessel having a rim, a bottom surface and a medial surface which lies between the rim and the bottom surface, comprising:

an edge section for attachment to the rim of the vessel, said edge section having a channel which fits over the rim of the vessel along the full length of the rim and further having means for holding the channel in place on the full length of the rim;

a bottom web section which covers the entire bottom surface of the vessel when the liner is in place in the vessel; and

a spacer web section extending between the edge section and the bottom web section which covers the entire medial surface of the vessel.

said spacer web section including a spacing portion raised inwardly so as to stand away from the medial surface of said vessel, such that when a second vessel of the same shape is nested within the vessel, the second vessel is prevented from lying tightly against the interior surfaces of the vessel.

4,508,769

PROCESS TO FORM AMORPHOUS, CRYSTALLIZABLE THERMOPLASTIC POLYMERS

Nicholas Vanderkooi, Jr., Pompton Plains; Philip E. Stevenson, South Orange, and Robert J. Welgos, Wharton, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 395,432, Jul. 6, 1982, Pat. No. 4,455,417.

This application Feb. 15, 1984, Ser. No. 580,396

Int. Cl.³ F16L 11/00

U.S. Cl. 428—36 **9 Claims**

1. An article of manufacture made of a crystallizable amorphous thermoplastic polymer composition having a modulus of rigidity G which decreases with increasing temperature to a G_{min} at T_{min} and subsequently increases with increasing tem-

perature from G_{min} to G_{cry} at T_{cry} at which point there is a decrease in the rate at which G changes with increasing temperature, the polymer crystallizing below T_{cc} upon cooling from a temperature above T_{cc}, the article having a thickness of from 0.127 cm (0.050 inches) to 1.27 cm (0.500 inches).

3. The article as recited in claim 1 in the form of a tube.

4,508,770

ROAD REPAIR MATERIAL OF KNITTED UNIDIRECTIONAL GLASS ROVING MAT COATED WITH ELASTOMERIC MODIFIED ASPHALT

John W. Muncaster, Columbus; Michael G. Roberts, Heath; R. David Rowlett, Granville; Todd B. Hoitink, Columbus; William E. Uffner, Newark, and Robert N. White, Etna, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 19, 1984, Ser. No. 590,674
Int. Cl.³ B32B *3/26*
U.S. Cl. 428—63 **2 Claims**

1. A knitted unidirectional mat of glass rovings factory coated with elastomeric modified asphalt, for use in road repairing.

4,508,771

EXTRUDED CARPET BACKING WITH RESIN AND ELASTOMER COMPONENTS

Clarence Peoples, Jr., Rockwell, N.C.; Robert C. Puydak, East Orange, and Deborah S. Jansen, East Windsor, both of N.J., assignors to Exxon Research & Engineering Co. and Collins and Aikman Corporation, both of, Del., a part interest to each

Filed Nov. 19, 1979, Ser. No. 95,565
Int. Cl.³ B32B *3/02, 33/00*
U.S. Cl. 428—95 **63 Claims**

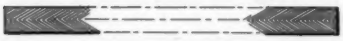
33. A carpet construction comprising a plurality of carpet fibers, and an extrudable thermoplastic acoustical and thermal barrier comprising from 10 up to about 25 weight percent of a thermoplastic resin component comprising a copolymer of ethylene and an unsaturated ester of a lower carboxylic acid, from about 4 to about 15 weight percent of an olefinic elastomer component, and from about 60 to about 85 weight percent of a filler component.

4,508,772

PRESSED COMPOSITE ASSEMBLY AND METHOD

Mark T. Churchland, Vancouver, and David Parker, West Vancouver, both of Canada, assignors to MacMillan Bloedel Limited, Vancouver, Canada

Filed Nov. 1, 1983, Ser. No. 547,577
Int. Cl.³ B29J *5/02, 5/04;* **B32B** *5/08, 31/20*
U.S. Cl. 428—106 **20 Claims**



1. In a continuous process of forming an elongate pressed composite assembly from a plurality of elongate strands by subjecting the strands to heat and pressure wherein the improvement comprises a method for compressing a particularly arranged composite mat of strands so as to compensate for internal stresses imparted to said pressed composite assembly during compressing because of the angle at which the strands are stacked, including the steps of:

(a) forming a first lay-up containing a plurality of strands in a generally parallel, longitudinally aligned relationship and in a generally random overlapping relationship wherein succeeding strands generally overlap only a portion of preceding strands so that the strands are, on the average, angled above the horizontal;

(b) forming a second lay-up containing a plurality of strands in a generally parallel, longitudinally aligned relationship and in a generally random overlapping relationship wherein succeeding strands generally overlap only a portion of preceding strands so that the strands are, on the average, angled above the horizontal;

(c) inverting one of said first or second lay-ups and positioning it on top of the other of said first or second lay-ups to form a composite mat; and

(d) transporting the composite mat through a compressing zone of a press assembly whereby the internal stress in each half of the pressed composite assembly due to the angle at which the strands are stacked is offset by the internal stress in the opposing half of the pressed composite assembly.

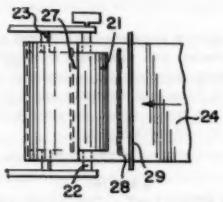
13. An elongate pressed composite assembly formed by compressing a particularly arranged composite mat of elongate strands between converging facing walls of a press assembly so that the internal stress in horizontal sections of the pressed composite assembly due to said compressing is offset by a stress due to the particular arrangement of elongate strands in said composite mat, said particularly arranged composite mat comprising one lay-up inverted and positioned above another lay-up, said lay-ups containing a plurality of strands in a generally parallel, longitudinally aligned relationship and in a generally random overlapping relationship wherein succeeding strands generally overlap only a portion of preceding strands so that the strands are, on the average, angled above the horizontal.

4,508,773

PAPER PRODUCT AND GLUE THEREFOR

Gary A. Maxwell, Lisle, Ill., assignor to Eschem Inc., Chicago, Ill.

Filed Apr. 27, 1983, Ser. No. 489,154
Int. Cl.³ B32B *27/14, 9/06;* **C09J** *5/02*
U.S. Cl. 428—198 **37 Claims**



1. A cellulosic article having portions thereof adhered to each other, comprising the portions being adhered together by a rapidly setting, aqueous protein-based animal glue formulation that is set as a glue strip of the cellulosic article,

said glue formulation being a water-soluble blend of: (a) between about 20 and about 40 weight percent, based on total weight of the formulation, of an animal protein component derived from collagen, (b) water, and (c) a tack enhancing agent which is a water soluble inorganic salt;

said water soluble inorganic salt including an anion that is divalent at the pH value of the glue formulation, said divalent anion being present in the glue formulation at a concentration that is effective to provide a controlled rapid setting time, up to the solubility limit of the soluble salt within the glue formulation; and

said set glue strip having been formed by controlled rapid setting of said glue formulation that had been applied to the cellulosic article at an elevated temperature greater than room temmperature;

said set glue strip had been applied at a temperature between about 100° and about 180° F.

4,508,774

CELLULAR, MOLDED POLYURETHANE PARTS, PROCESS FOR THEIR PREPARATION BY THERMOFORMING OF POLYESTER-URETHANE FOAM AND THEIR USE

Herbert Grabhoefer, Limburgerhof, and Otto Volkert, Weisenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,888
Int. Cl.[3] C08G 18/14
U.S. Cl. 428—220 13 Claims

1. A cellular polyurethane having a density of 15 Kg/m^3 to 400 Kg/m^3 prepared by: thermoforming in a molding device at a temperature of from about 140° C. to 200° C. and at a compression factor of from 1 to 10, a polyurethane foam having a density of from 15 Kg/m^3 to 40 Kg/m^3, wherein said polyurethane foam is prepared by reacting an isocyanate component comprising a member selected from the group consisting of;

(a) polymeric MDI;

(b) carbodiimide modified MDI;

(c) urethane modified MDI; and

(d) mixtures thereof,

with a polyol component selected from the group consisting of:

(e) a polyester polyol mixture containing one or more polyester polyols; and

(f) a polyester/polyether polyol mixture comprising one or more polyester polyols and one or more polyether polyols, provided that the polyester polyols comprise at least 55 percent by weight of said polyol component,

in the presence of catalysts, blowing agents, and optionally chain extenders, cross-linking agents, additives, and auxiliaries.

4,508,775

GAS PERMEABLE COMPOSITE STRUCTURES

Joseph G. Adiletta, Thompson, Conn., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 542,026, Oct. 14, 1983, abandoned. This application Dec. 28, 1983, Ser. No. 566,404
Int. Cl.[3] B32B 5/16
U.S. Cl. 428—240 20 Claims

1. A flexible, microporous, hydrophobic and oleophobic film-like composite structure comprising:

(1) from about 25 to about 75 parts by weight of inorganic, reinforcing microfibers,

(2) from about 75 to about 25 parts by weight of a polymeric binding agent in the form of a continuous matrix, said binding agent being derived from an emulsion or latex of particles of said binding agent having a size of less than about 1 micrometer in a liquid, said binding agent and said microfibers being present in the composite structure in a total amount of 100 parts by weight, based on the weight of said binding agent and said microfibers, and

(3) a treating agent present in an amount sufficient to render the composite structure both hydrophobic and oleophobic.

4,508,776

METALLISED FABRIC

Theodore D. Smith, Heathrow, Brimpton Rd., Baughurst, Hampshire, England

Filed Oct. 11, 1983, Ser. No. 540,673
Claims priority, application United Kingdom, Oct. 12, 1982, 8229142
Int. Cl.[3] B32B 15/14; E06B 9/24
U.S. Cl. 428—248 10 Claims

1. A microporous metallised fabric comprising a microporous flexible fabric substrate having a layer of metal deposited on at least one side thereof, and a thin film of a polyamide-based ink printed on to the deposited metal at such a rate as not significantly to affect the microporous nature of the fabric substrate.

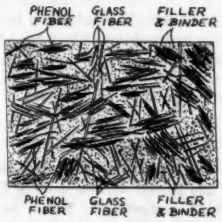
8. A method of manufacturing a microporous metallised fabric, including a first step of metallising at least one surface of a microporous fabric substrate and a second step of printing on the metallised surface a thin film of a polyamide-based ink at such a rate that the microporous structure of the metallised fabric is not significantly affected by the ink film.

4,508,777

COMPRESSED NON-ASBESTOS SHEETS

Tsutomu Yamamoto; Masaaki Ashizawa; Kazuo Nishimoto, and Yuji Sekiguchi, all of Yokohama, assignors to Nichias Corporation, Tokyo, Japan

Continuation of Ser. No. 243,575, Mar. 13, 1981, abandoned. This application Dec. 30, 1982, Ser. No. 454,791
Claims priority, application Japan, Mar. 14, 1980, 55-32536
Int. Cl.[3] D04H 1/08
U.S. Cl. 428—280 13 Claims



1. A compressed non-asbestos gasket material sheet having an improvement which comprises in combination:

a base including 25 to 75% by weight of at least two types of fibers selected from at least one of two groups of inorganic fibers other than asbestos and a group of organic fibers, the inorganic and organic fibers having a uniform mix completely free of asbestos;

rubber as a binder for said base including 5 to 50% by weight thereof selected from the group consisting of natural rubber and synthetic rubber in a solvent with the uniform mix of inorganic and organic fibers;

the remainder fillers and rubber chemicals in a compressed sheet having void content at an extremely low level that avoids shrinkage upon rubber vulcanization into an intimate and dense mix completely free of asbestos.

4,508,778

YARNS AND FIBERS GOOD PROPERTIES, BASED ON ATACTIC POLYVINYL CHLORIDE, AND PROCESS FOR THE PRODUCTION

Georges Achard, Décines, France, assignor to Rhovyl, Lyons, France

Continuation of Ser. No. 328,522, Dec. 8, 1981,. This application Aug. 12, 1983, Ser. No. 522,746
Claims priority, application France, Dec. 8, 1980, 80 26046
Int. Cl.[3] B32B 27/00; D02P 3/00; D01D 5/12
U.S. Cl. 428—364 2 Claims

1. An improved dry-spun filament, yarn or fiber consisting essentially of atactic polyvinyl chloride, and having the following characteristics:

a residual shrinkage in boiling water of less than 3%,

a modulus of elasticity which is greater than or equal to 2 kN/mm^2,

an orientation index of the crystalline zones which is greater than or equal to 70%,

an orientation index of the mesomorphic zones which is greater than or equal to 8%, and

an orientation index of the amorphous zones which is greater than or equal to 5%.

4,508,779

ENAMELLED WIRE

Masayoshi Miyake; Isao Ueoka; Munetaka Kawaguchi; Hirohiko Nakabayashi, and Teruyuki Yamamoto, all of Aichi, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 18, 1982, Ser. No. 389,800
Claims priority, application Japan, Jun. 18, 1981, 56-94757
Int. Cl.[3] B32B *27/00*; H01B *7/00*
U.S. Cl. 428—383 10 Claims

1. An enameled wire comprising a layer of baked insulation formed on a conductor either directly or through another insulation, wherein at least the outermost layer of said wire has an insulation coating formed by applying and baking a wire enamel composition consisting essentially of a polyester resin at least one molecule of which is terminated with an alkyl group having 21 or more carbon atoms prepared by reacting component (i) a polyhydric alcohol, component (ii) a polybasic carboxylic acid or a derivative thereof and component (iii) a compound that has a straight alkyl group having 21 or more carbon atoms in the molecule and which has a functional group capable of reaction with either component (i) or (ii), wherein component (iii) is used in an amount of from 0.4 to 6.0% by weight of the resin obtained.

4,508,780

METALLIZED POLYMER GRANULES, AND THEIR USE

Kirkor Sirinyan, and Rudolf Merten, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,614
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1982, 3215413
Int. Cl.[3] B32B *5/16, 15/08*
U.S. Cl. 428—407 16 Claims

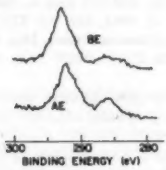
1. Polymer granules having a single particle volume of 0.01 mm^3 to 150 mm^3 and a metal layer of 0.5 to 35 percent by weight, relative to polymer said metal layer obtained by currentless chemical metallization after activating the surfaces of the granules with metallo-organic compounds of elements of group 1B or VIII of the periodic table of the elements and subsequently reducing said metallo-organic.

4,508,781

FLUORINATION BY INORGANIC FLUORIDES IN GLOW DISCHARGE

Toshiharu Yagi, Takarazuka, Japan, and Attila E. Pavlath, Walnut Creek, Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 7, 1982, Ser. No. 385,674
Int. Cl.[3] B32B *27/00*; B05D *3/06*
U.S. Cl. 428—409 13 Claims



1. An essentially surface fluorinated carbon containing synthetic or natural polymer, the fluorinated surface of which is comprised of carbon-fluorine entities and has a ratio of fluorine to carbon in the range of about 1.14 to about 1.82, the surface of said polymer prior to fluorination being capable of forming a carbon-fluorine bond on fluorination with fluorine radicals derived from inorganic fluoride vapors dissociated in an activated glow discharge reactor.

4,508,782

BASE FILM FOR MAGNETIC RECORDING TAPE WITH F-5 VALUES OF 9-15 KG/MM^2

Yasuki Miura, Otsu; Masahiko Motegi, Hikone, and Kazuo Okabe, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 563,018, Dec. 19, 1983, abandoned, which is a continuation of Ser. No. 483,849, Apr. 15, 1983, abandoned, which is a continuation of Ser. No. 223,401, Jan. 8, 1981, abandoned. This application Jun. 27, 1984, Ser. No. 625,185
Int. Cl.[3] H01F *10/00*
U.S. Cl. 428—409 7 Claims

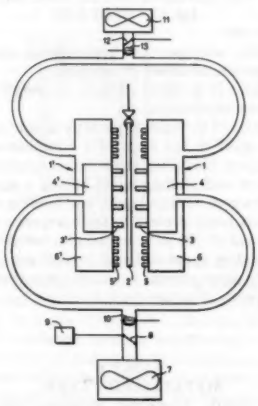
1. A biaxially oriented polyester base film for a magnetic recording tape, which possesses an F-5 value of from 9 to 15 Kg/mm^2 as measured along both the longitudinal and transverse directions, and for which the ratio of the average surface roughness when expressed as microns to the average particle size of included particles, when expressed as microns and measured under dark field illumination, is from 2.0×10^{-3} to 5.1×10^{-3}, and said average surface roughness is from 0.005 to 0.040 micron.

4,508,783

METHOD FOR THE DIFFERENTIATED HARDENING OF GLASS SHEETS, ESPECIALLY OF AUTOMOBILE WINDSHIELDS, AND TEMPERED GLASS SHEET

Claude Aubry; Jacques Chaumette, both of Thourotte, and Pierre Touchon, Le Pecq, all of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Apr. 18, 1983, Ser. No. 485,849
Claims priority, application France, Apr. 16, 1982, 82 06596
Int. Cl.[3] C03B *27/04*
U.S. Cl. 428—410 5 Claims



1. A method of differentially tempering a flat glass sheet so as to harden the entire surface of said sheet, said sheet including a central zone and a peripheral zone having mutually different degrees of surface hardening, said method including steps of:

uniformly heating said entire glass sheet to a degree sufficient for tempering to occur upon cooling;

rapidly cooling said central zone at a first rate sufficient to temper said glass sheet; and

subsequent to beginning said cooling of said central zone, rapidly cooling said peripheral zone at a second rate sufficient to temper said glass sheet, said second rate being

greater than said first rate, wherein said cooling steps are performed such that both of said zones of said glass sheet are simultaneously solidified.

5. Glass sheet characterized in that it presents a central zone of at least 20 cm×50 cm, having after fragmentation a visibility of at least 15% of visibility before fragmentation, this ratio being determined by the total of the surfaces of all fragments of at least 2 cm^2 divided by the total surface of the central zone, no fragment in this zone being allowed to have a surface area greater than 16 cm^2, and characterized in that it presents also a peripheral zone having after fragmentation in a square of 5 cm×5 cm, from 40 to 350 fragments, having no needles greater than 7.5 cm in length, said glass sheet being flat, wherein said glass sheet has no hoop stresses between said central and peripheral zones.

4,508,784

4-STYRYL-4'-VINYLBIPHENYLS, THE PRODUCTION THEREOF AND USE THEREOF AS FLUORESCENT

Leonardo Guglielmetti, Bottmingen, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

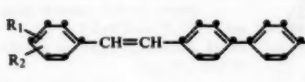
Continuation of Ser. No. 327,665, Dec. 7, 1981, abandoned. This application Jan. 23, 1984, Ser. No. 572,973

Claims priority, application Switzerland, Dec. 12, 1980, 9192/80

Int. Cl.³ B32B *9/04*

U.S. Cl. 252—301.21 **24 Claims**

1. A 4-styryl-4'vinylbiphenyl of the formula



wherein each of R_1 and R_2 is hydrogen or a non-chromophoric substituent, or both together when ortho to each other complete a fused ring, R_3 is a second order non-chromophoric substituent and R_4 is hydrogen or alkyl or alkenyl, each unsubstituted or substituted by a non-chromophoric group.

21. A process for whitening a natural, regenerated or synthetic organic substrate of high molecular weight, which process comprises incorporating in or applying to said substrate a compound of claim 1.

24. Organic material of high molecular weight, containing 0.001 to 2%, of a fluorescent whitening agent of claim 1.

4,508,785

IN-MOLD COATING

David S. Cobbledick, Kent; Donald F. Reichenbach, Massillon, and Henry Shanoski, Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 514,415, Jul. 18, 1983, and a continuation-in-part of Ser. No. 316,592, Nov. 2, 1981, abandoned. This application Mar. 26, 1984, Ser. No. 592,772

Int. Cl.³ B32B *27/06, 27/36*

U.S. Cl. 428—424.4 **5 Claims**

1. A laminate comprising an adherent, thermoset in-mold coating composition in-mold coated and cured at a temperature of from about 290°–310° F. and at a pressure of about 1000 Psi for 0.5 to 3 minutes onto a molded thermoset polyester resin or thermoset vinyl ester resin glass fiber composition containing from about 10 to 75% by weight of glass fibers, said in-mold coating composition comprising the reaction product of 100 parts by weight of at least one polymerizable epoxy based oligomer having at least two acrylate groups and a weight average molecular weight of from about 500 to 1,500, from about 80 to 160 parts by weight of at least one copolymerizable ethylenically unsaturated monomer selected from the group consisting of styrene, alpha methyl styrene, vinyl toluene, t-butyl styrene, chlorostyrene, methyl methacrylate, diallyl phthalate (with styrene or methyl methacrylate), triallyl cyanurate, triallyl isocyanurate, divinyl benzene and methyl acrylate, from about 10 to 120 parts by weight of at least one copolymerizable monoethylenically unsaturated compound having a —CO— group and a $—NH_2$, —NH— and/or —OH group and from about 5 to 120 parts by weight of a copolymerizable or cocurable diacrylate compound having a weight average molecular weight of from about 250 to 5,000 and being selected from the group consisting of

(I) at least one polyoxyalkylene glycol oligomer having two acrylate groups and

(II) at least one polyurethane oligomer having two acrylate groups and mixtures of (I) and (II)

in admixture with from about 20 to 90 parts by weight of polyvinyl acetate, from about 0.2 to 5 parts by weight of at least one zinc salt of a fatty acid having at least 10 carbon atoms, from about 5 to 30 parts by weight of conductive carbon black and from about 50 to 155 parts by weight of a filler.

4,508,786

POLYOLEFIN RESIN COMPOSITION

Tadao Ishibashi, and Youichi Kugimiya, both of Ichiharashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Division of Ser. No. 520,171, Aug. 4, 1983, Pat. No. 4,487,871. This application Jun. 29, 1984, Ser. No. 625,951

Claims priority, application Japan, Aug. 5, 1982, 57-136660

Int. Cl.³ B32B *5/00;* **C23C** *15/00*

U.S. Cl. 428—461 **2 Claims**

1. In the process of subjecting a resin film base to corona discharge treatment and then metallizing in vacuo, the improvement which comprises using a resin film consisting of a blend of

(a) crystalline propylene-alpha-olefin copolymer,

(i) containing at least 70% by weight of propylene, and

(ii) having a crystalline melting point of lower than 150° C. with

(b) a high density polyethylene having a density of at least 0.940 g/cm^3,

(c) said blend containing 96–80% by weight of said copolymer and 4–20% by weight of said polyethylene,

(d) the ratio of the melt flow rate of said polyethylene to the melt flow rate of said copolymer being at least 0.7,

and

at least one additive selected from the group consisting of phenolic antioxidants and phosphoric antioxidants having a molecular weight of 500 or more and being present in an amount of 0.01 to 0.30% by weight based on the weight of the entire composition.

2. A metallized polyolefin resin film wherein the polyolefin resin film is a polymeric blend consisting of:

(a) a crystalline propylene-alpha-olefin copolymer

(i) containing at least 70% by weight of propylene, and

(ii) having a crystalline melting point of lower than 150° C. with

(b) a high density polyethylene having a density of at least 0.940 g/cm^3,

(c) said blend containing 96–80% by weight of said copolymer and 4–20% by weight of said polyethylene,

(d) the ratio of the melt flow rate of said polyethylene to the melt flow rate of said copolymer being at least 0.7,

and

at least one additive selected from the group consisting of phenolic antioxidants and phosphoric antioxidants having a molecular weight of 500 or more and being present in an amount of 0.01 to 0.30% by weight based on theveight of the entire composition.

4,508,787

IMIDIZED SURFACE PROTECTION FOR MALEIC ANHYDRIDE INTERPOLYMER ARTICLES

William M. Giffen, Jr., Hudson; George S. Li, Macedonia, and Arthur F. Miller, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 17, 1980, Ser. No. 217,482
Int. Cl.³ B32B *9/02*; B05D *3/02*
U.S. Cl. 428—473.5 **13 Claims**

1. A process for forming a protective surface on an article, the processing comprising producing a layer consisting essentially of RNH_3^+ salts of a maleic anhydride interpolymer on the surface of the article, where R is hydrogen or an alkyl group of from 1 to 6 carbon atoms, and heating the article at a temperature sufficient to form a cyclic imide structure.

12. The article treated by the process of claim **1**.

4,508,788

PLASMA SPRAY POWDER

Richard F. Cheney, Sayre, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 420,456, Sep. 9, 1982, abandoned. This application Mar. 9, 1984, Ser. No. 587,833
Int. Cl.³ B32B *15/00*; C23C *7/00*
U.S. Cl. 428—570 **5 Claims**

1. A plasma spray coating consisting essentially of silicon nitride particles in a matrix of plasma meltable metal.

4,508,789

LOW REFLECTANCE, LOW EMISSIVITY SPUTTERED FILM

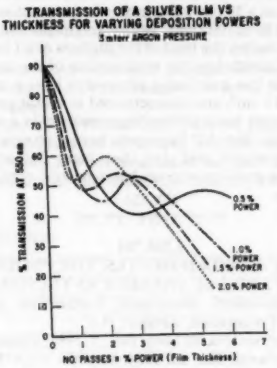
F. Howard Gillery, Allison Park, and Russell C. Criss, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

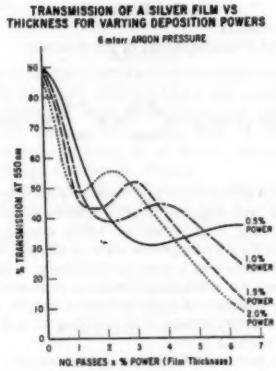
Division of Ser. No. 516,816, Jul. 25, 1983, Pat. No. 4,462,884. This application May 29, 1984, Ser. No. 614,358
Int. Cl.³ C23C *15/00*
U.S. Cl. 428—630 **8 Claims**

1. An article of manufacture comprising:

a. a transparent substrate;

b. sputtered onto a surface of said substrate a discontinuous agglomerated transparent silver film; and


TRANSMISSION OF A SILVER FILM VS THICKNESS FOR VARYING DEPOSITION POWERS
3 mtorr ARGON PRESSURE
% TRANSMISSION AT 550nm
0.5% POWER
1.0% POWER
1.5% POWER
2.0% POWER
NO. PASSES x % POWER (Film Thickness)


TRANSMISSION OF A SILVER FILM VS THICKNESS FOR VARYING DEPOSITION POWERS
6 mtorr ARGON PRESSURE
% TRANSMISSION AT 550nm
0.5% POWER
1.0% POWER
1.5% POWER
2.0% POWER
NO. PASSES x % POWER (Film Thickness)

c. sputtered over said discontinuous agglomerated transparent silver film a continuous transparent copper film.

4,508,790

TIN FREE STEEL HAVING AN EXCELLENT WELDABILITY AND ITS PRODUCTION METHOD

Nobuyoshi Shimizu; Terunori Fujimoto; Tsuneo Inui, and Masatoki Ishida, all of Yamaguchi, Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1984, Ser. No. 619,271
Int. Cl.³ C25D *5/12*, *5/34*, *5/48*, *11/38*
U.S. Cl. 428—632 **19 Claims**

1. A tin free steel having three layers consisting of a bottom layer of metallic chromium, a middle layer of nickel-zinc alloy and a top layer of hydrated chromium oxide on a steel base.

6. A process for continuously preparing a tin free steel as claimed in claim **1**, which comprises: (a) chromium plating a steel base to form a layer of metallic chromium and hydrated chromium oxide thereon: (b) nickel-zinc alloy plating the chromium plated steel base using a nickel-zinc alloy plating electrolyte under conditions sufficiently acidic to substantially dissolve said hydrated chromium oxide in said electrolyte; and (c) forming a layer of hydrated chromium oxide on the nickel-zinc alloy plated, chromium plated steel base of step (b).

8. The process for continuously preparing a tin free steel as claimed in claim **1**, which comprises: (a) chromium plating a steel base to form a layer of metallic chromium and hydrated

chromium oxide thereon; (b) removing the hydrated chromium oxide formed on the chromium plated steel base by a cathodic treatment in an acidic solution; (c) nickel-zinc alloy plating the chromium plated steel base; and (d) forming a layer of hydrated chromium oxide on the nickel-zinc alloy plated, chromium plated steel base of step (c).

4,508,791

ELECTRIC WIRE WITH A COPPER, SILVER, OR GOLD CORE CLAD WITH TUNGSTEN, MOLYBDENUM OR TUNGSTEN/MOLYBDENUM ALLOY

Isidoor K. Van Hoff, and Johannes H. P. M. Van Den Bergh, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 346,306, Feb. 5, 1982, Pat. No. 4,455,481. This application Dec. 7, 1983, Ser. No. 559,067

Claims priority, application Netherlands, Feb. 9, 1981, 8100601

Int. Cl.³ H05B *3/06*

U.S. Cl. 428—663 **2 Claims**

1. A wire made of a copper, silver or gold core and a tungsten, molybdenum or tungsten-molybdenum alloy cladding, having a diameter less than 50 micrometers and an electric resistivity from 2.0–5.0 $\mu\Omega$/cm.

4,508,792

ELECTROCHROMIC ELEMENT

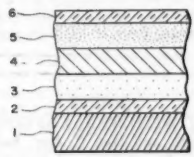
Kazuya Ishiwata, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1983, Ser. No. 549,427

Claims priority, application Japan, Nov. 16, 1982, 57-200911

Int. Cl.³ B41M *5/20*

U.S. Cl. 428—702 **7 Claims**



1. An electrochromic element comprising an electrochromic layer disposed between a pair of electrode plates, characterized in that the electrochromic layer is a coat formed by the ion plating of cobalt oxide in the presence of at least one of oxygen gas and/or water vapor.

4,508,793

AIR-COOLED FUEL CELL SYSTEM

Masao Kumata, Neyagawa, and Noriaki Matsuoka, Yawata, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

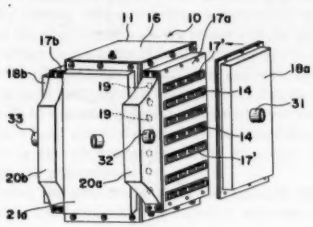
Filed Sep. 1, 1983, Ser. No. 528,443

Claims priority, application Japan, Sep. 8, 1982, 57-157133; Jun. 20, 1983, 58-111322; Jun. 30, 1983, 58-119801

Int. Cl.³ H01M *8/04*

U.S. Cl. 429—26 **9 Claims**

1. An air-cooled fuel cell system comprising a cell stack including substacks and cooling plate arranged between neighbouring two substacks; each substack comprising a plurality of unit cells each including an electrolyte matrix placed between two electrodes of a gas-diffusion-type, and bipolar plates each having fuel channels and process air channels and being arranged between two unit cells; said unit cells and bipolar plates being arranged in a stack and electrically connected in series; said cooling plates having passages for cooling air; said fuel cell system being characterized in that the system further comprises a process air inlet manifold mounted on one peripheral face of the cell stack where inlets of said process air channels are opened, a cooling air manifold mounted on said process air inlet manifold, said cooling plates extending from the



peripheral face of the cell stack and passing through the process air manifold in such a manner that the cooling air passages provided therein are communicated with said cooling air manifold.

4,508,794

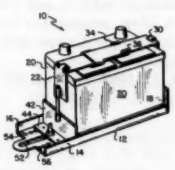
SECURITY BATTERY HOLDER

Anthony A. Wright, 1269 Clarendon, El Cajon, Calif. 92021

Filed Jan. 25, 1984, Ser. No. 573,836

Int. Cl.³ H01M *2/10*

U.S. Cl. 429—100 **11 Claims**



1. An automobile battery security holder comprising:

a generally rectangular planar support member having vertically extending side members extending along the lateral edges thereof for supporting and laterally confining a battery; and

an adjustable length security strap connected at one end to one end of said support member and releasably connected at the other end by keyed lock means to said support member for extending over the top of a battery for securing same to said support member, said security strap being constructed of a hardened metal for resisting the action of bolt cutters.

4,508,795

SODIUM-TETRAVALENT SULFUR MOLTEN CHLOROALUMINATE CELL

Gleb Mamantov, Knoxville, Tenn., assignor to University of Tennessee Research Corporation, Knoxville, Tenn.

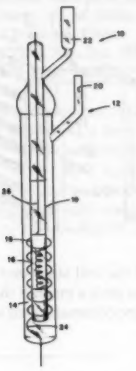
Filed Feb. 10, 1984, Ser. No. 578,885

Int. Cl.³ H01M *4/36*

U.S. Cl. 429—103 **4 Claims**

1. An improved rechargeable sodium-tetravalent sulfur molten chloroaluminate cell having a cathode compartment containing a molten cathode composition including sulfur in a chloroaluminate melt and a cathode current collector, an anode compartment containing molten sodium and an anode current collector, and a β''-alumina sodium ion conductor in contact with said molten cathode composition and said molten sodium, the improvement comprising: a sulfur to aluminum mole ratio in said cathode composition of above about 0.15,

whereby said improved cell operates at low temperatures to provide high energy densitites and operates at moderate temperatures to provide high power densities and high energy densities.



4,508,796

CHROMIUM (V) COMPOUNDS AS CATHODE MATERIAL IN ELECTROCHEMICAL POWER SOURCES

Frank M. Delnick; Ronald A. Guidotti, and David K. McCarthy, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 21, 1983, Ser. No. 487,492

Int. Cl.³ H01M *6/20*

U.S. Cl. 429—112 **7 Claims**

1. In a thermal battery having a plurality of single cell pellets arranged in a stack, with each single cell comprising a heat pellet and two current collectors, an anode pellet, a separator pellet, and a cathode pellet, the improvement wherein said cathode material comprises a system compatible chromium (V) compound.

4,508,797

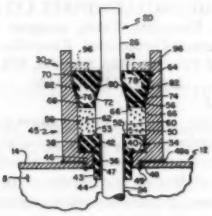
HERMETICALLY SEALED ELECTRICAL FEEDTHROUGH FOR HIGH TEMPERATURE SECONDARY CELLS

Reinhard Knoedler, Nussloch, Fed. Rep. of Germany; Paul A. Nelson, Wheaton, Ill.; Hiroshi Shimotake, Hinsdale, Ill., and James E. Battles, Oak Forest, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 26, 1983, Ser. No. 517,473

Int. Cl.³ H01M *2/08, 2/02*

U.S. Cl. 429—184 **19 Claims**



1. In a lithium/metal sulfide cell, a passthrough seal for electrically isolating a cell terminal from the cell housing and for sealingly insolating the cell chamber from the exterior thereof, comprising an upstanding wall sealed to the housing and located generally annularly of and spaced from the terminal as it is extended through an opening in the housing, a lower insulator ring fitted snuggly over the terminal and within the upstanding wall, cooperating shoulder means on the lower ring and on the housing and terminal respectively operable to preclude axial movement of the terminal inwardly relative to the housing, a powdered insulator disposed over the lower ring and between the upstanding wall and the terminal, an upper insulator ring fitted snugly between the upstanding wall and the terminal and against the powdered insulator opposite the lower ring, the upper ring and the upstanding wall and terminal having pairs of opposed surfaces that move closer together as the ring is moved axially inwardly toward the powdered insulator, and rings of soft bonding material located annularly of the terminal and confined between the opposed pairs of surfaces, said seal being set upon axial movement of the upper ring toward the powdered insulator firstly to compress that powdered insulator to a high order of compression and secondly to compress the rings of soft bonding material sufficiently to bond them between the adjacent surfaces.

4,508,798

CELL WITH $COCL_2$ CATHODE

Mysore L. Gopikanth; Han C. Kuo, both of Burlington, Mass., and William L. Bowden, Nashua, N.H., assignors to Duracell Inc., Bethel, Conn.

Filed Jun. 30, 1983, Ser. No. 509,679

Int. Cl.³ H01M *6/14*

U.S. Cl. 429—196 **10 Claims**

1. A non-aqueous, electrochemical cell comprising an anode comprised of an alkali or alkaline earth metal and an inorganic electrolyte comprised of SO_2 with an electrolyte salt dissolved therein, characterized in that said cell contains an active cathode comprised of at least 55% by weight of $CoCl_2$ admixed with a conductive carbon material, with said conductive carbon material comprising from 10–30% by weight of said cathode.

4,508,799

CELL WITH $NICL_2$ CATHODE

Mysore L. Gopikanth, and Han C. Kuo, both of Burlington, Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Jun. 30, 1983, Ser. No. 509,689

Int. Cl.³ H01M *6/14*

U.S. Cl. 429—196 **10 Claims**

1. A non-aqueous, electrochemical cell comprising an anode comprised of an alkali or alkaline earth metal and an inorganic electrolyte comprised of SO_2 with an electrolyte salt dissolved therein, characterized in that said cell contains an active cathode comprised of at least 55% by weight of $NiCl_2$ $NiCl_2$ admixed with a conductive carbon material with said conductive carbon material comprising from 10–30% by weight of said cathode.

4,508,800

CELL WITH $FEBR_3$ CATHODE

Mysore L. Gopikanth; Han C. Kuo, both of Burlington, and Carl R. Schlaikjer, Winchester, all of Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Jun. 30, 1983, Ser. No. 509,693

Int. Cl.³ H01M *6/14*

U.S. Cl. 429—196 **10 Claims**

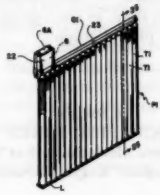
1. A non-aqueous, electrochemical cell comprising an anode comprised of an alkali or alkaline earth metal and an inorganic electrolyte comprised of SO_2 with an electrolyte salt dissolved therein, characterized in that said cell contains an active cathode comprised of at least 55% by weigth of $FeBr_3$ admixed with a conductive carbon material, with said conductive carbon material comprising from 10–30% by weight of said cathode.

4,508,801

LEAD ACID BATTERY WITH SELF-REGISTERING GRID COMPLEMENT AND METHODS OF MAKING AND OPERATING SAME

Roy A. Guimond, Holden; John E. Gulliksen, Shrewsbury, and Nanci W. Reed, Sudbury, all of Mass., assignors to Koehler Manufacturing Company, Marlborough, Mass.

Continuation-in-part of Ser. No. 239,159, Feb. 27, 1981, Pat. No. 4,359,509. This application Sep. 3, 1981, Ser. No. 299,157
The portion of the term of this patent subsequent to Aug. 25, 1998, has been disclaimed.
Int. Cl.[3] H01M *4/76, 2/18, 10/44/6/00*
U.S. Cl. 429—238 8 Claims



1. A method of making a tubular positive electrode for use in lead-acid storage batteries wherein grid structure includes a lug portion, a top bar portion having a plurality of spaced apart spines extending therefrom and having shaped surfaces including converging flat surfaces at an upper side thereof and the said electrode further including tube means and a grid complement member comprising a lug enclosure portion and a top bar enclosure portion including angularly displaceable side portions, and said side portions of the grid complement being extended to provide elongated tube engaging surfaces and also having inner surfaces which are shaped to mate with the shaped surfaces of the top bar in self adjusting relationship thereto, said method being characterized in that the lug portion of the grid structure is first inserted into the lug enclosure portion of the grid complement with initial angular displacement of the side wall portions occurring, thereafter advancing the said grid structure into the grid complement to further angularly displace the said side wall portions, then advancing and engaging the top bar against the top bar enclosure into a position in which the said angularly displaceable side portions revert into self-registering relationship with the shaped portions of the top bar lying between the spines, thereafter distensibly fitting the tube means over the outer sides of the tube engaging surfaces, and finally advancing the tube means into contact with the side portions of the grid complement.

4,508,802

MULTIPLE REGISTRATION AND IMAGING PROCESS TO FORM A SET OF REGISTERED IMAGED ELEMENTS

Robert B. Heiart, Middletown, and Abraham B. Cohen, Springfield, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 11, 1982, Ser. No. 387,537
Int. Cl.[3] G03F *9/00*
U.S. Cl. 430—22 18 Claims

1. A process of registering and imagewise exposing to actinic radiation a set of sheet substrates registratable to one another to produce a composite image, each substrate containing a photosensitive layer comprising the steps of:

(1) advancing a substrate to a position in a device to undertake in either order or concurrently

(a) aligning the substrate and a photomask in a predetermined relationship to one another through a hinged relationship of the photomask and the substrate to permit substantially identical alignment of a photomask and each similar sheet substrate of the sequence;

(b) applying a liquid between the photosensitive layer and the photomask;

(2) contacting through the liquid the substrate containing the photosensitive layer and the photomask wherein liquid between the photosensitive layer and the photomask is displaced when the substrate and photomask are brought into more intimate contact by an advancing pressure line whereby during said contacting substantially no movement of the photosensitive layer relative to the photomask occurs other than a more intimate contact due to displacement of the liquid from a liquid layer and whereby at least one of a set of interfacial or viscous forces due to the liquid layer aids to maintain the photosensitive layer and photomask in a fixed position relative to one another;

(3) exposing the photosensitive layer to actinic radiation through the photomask;

(4) removing the photomask from the exposed photosensitive layer and removing the exposed substrate from the device;

(5) repeating steps 1 to 4 for each sheet substrate of said set employing at least one additional photomask whereby the exposed substrates are registratable to one another to produce a composite image.

4,508,803

PHOTOCONDUCTIVE DEVICES CONTAINING NOVEL BENZYL FLUORINATED SQUARAINE COMPOSITIONS

Kock-Yee Law, Fairport, and Frank C. Bailey, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1983, Ser. No. 558,248
Int. Cl.[3] G03G *5/06*
U.S. Cl. 430—59 36 Claims

1. An improved photoresponsive device comprised in the order stated of (1) a supporting substrate, (2) a photoconductive layer comprised of the squaraine compositions selected from the group consisting of bis(2-fluoro-4-methylbenzylaminophenyl)squaraine, bis(2-fluoro-4-methyl-p-chlorobenzylaminophenyl)squaraine, bis(2-fluoro-4-methyl-p-fluorobenzylaminophenyl)squaraine, and bis(2-fluoro-4-methyl-m-chlorobenzylaminophenyl)squaraine, and (3) a diamine hole transport layer.

4,508,804

SUPPORT FOR ELECTROGRAPHIC PLATE-MAKING MATERIAL AND A LITHOGRAPHIC PRINTING PLATE EMPLOYING SAME

Yasuzi Asao, and Tetsuro Fuchizawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 13, 1983, Ser. No. 541,635
Claims priority, application Japan, Oct. 13, 1982, 57-179377
Int. Cl.[3] G03G *5/14;* B32B *27/08, 27/10*
U.S. Cl. 430—62 15 Claims

1. A lithographic printing plate comprising:

(A) a support and (B) a photoconductive layer coated on said support, wherein said support is a support for electrophotographic plate-making material having a volume-electrric resistance of $10^{10}\Omega$ or less and comprising:

(1) a paper base;

(2) a polyolefin laminate layer on both sides of said paper base; and

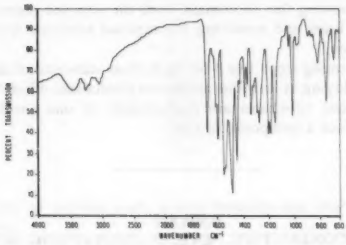
(3) an ionomer coated between said paper base and said polyolefin laminate layer, wherein said ionomer is prepared by ion-cross linking a copolymer comprising at least one α-olefin and 0.2 to 40 mol % of at least one α,β-ethylenically unsaturated carboxylic acid with a monovalent, divalent or trivalent ion of a metal of Group I, II, III, IV-A or VIII of the periodic table, said metal ion providing a degree of neutralization of the carboxylic groups in the range of from 5 to 97%.

4,508,805

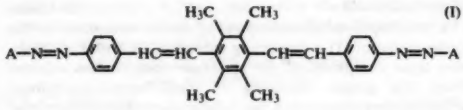
DISAZO COMPOUNDS, PHOTOCONDUCTIVE COMPOSITIONS AND ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS CONTAINING THE SAME

Kouichi Kawamura; Seiji Horie; Naonori Makino, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 16, 1983, Ser. No. 523,920
Claims priority, application Japan, Aug. 16, 1982, 57-141821
Int. Cl.³ G03G 5/06
U.S. Cl. 430—72 **9 Claims**

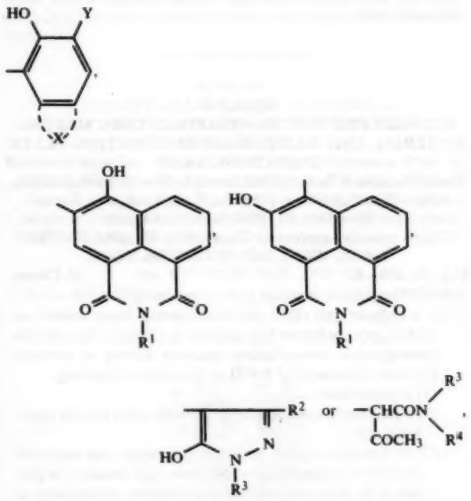


1. Photoconductive compositions which contain disazo compounds represented by the general formula (I):

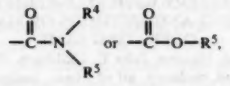


(I)

wherein A represents



wherein X represents an atomic group necessary to form an aromatic or heterocyclic ring (which may be substituted or nonsubstituted) by condensing with the benzene ring in the above described formula to which a hydroxyl group and Y are attached, Y represents



R^1 represents an alkyl group, a phenyl group or a substituted alkyl or phenyl group, R^2 represents a hydrogen atom, a lower alkyl group, a carbamoyl group, a carboxyl group, an alkoxycarbonyl group, an aryloxycarbonyl group or a substituted or nonsubstituted amino group, R^3 and R^5 each represents an alkyl group, an aromatic group, a heteroaromatic group or a substituted alkyl, aromatic or heteroaromatic group, and R^4 represents a hydrogen atom, an alkyl group, a phenyl group or a substituted alkyl or phenyl group.

4,508,806

ELECTROPHOTOGRAPHIC TONER COMPOSITION

Osamu Oseto, and Fumio Moriuchi, both of Suita, Japan, assignors to Arakawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1983, Ser. No. 514,049
Claims priority, application Japan, May 9, 1983, 58-80477
Int. Cl.³ G03G 9/08
U.S. Cl. 430—109 **9 Claims**

1. A toner composition for electrophotography comprising a resin binder and a colorant, said resin binder being a polymeric rosin compound having a glass transition temperature of 30° to 100° C. and a gel fraction of 1 to 99% to xylene and being prepared by the reaction of:

(a) a glycidyl ester of rosin,

(b) a dicarboxylic acid or a dicarboxylic acid anhydride, and

(c) at least one crosslinking agent selected from the group consisting of a polyfunctional epoxy compound, a polybasic acid having a valency of not less than 3 and its anhydride, and a polyhydric alcohol having a valency of not less than 3.

4,508,807

PHOTOSENSITIVE MATERIAL EMPLOYING ENCAPSULATED RADIATION SENSITIVE COMPOSITION AND A TRANSPARENTIZABLE IMAGE-RECEIVING LAYER

Paul C. Adair, Chillicothe, Ohio, assignor to Mead Corporation, Dayton, Ohio

Filed Jul. 11, 1983, Ser. No. 512,268
Int. Cl.³ G03C 1/40, 1/00
U.S. Cl. 430—138 **18 Claims**

1. A photosensitive material comprising a microcapsule-containing layer including a plurality of rupturable microcapsules containing an internal phase, said internal phase including a radiation sensitive composition which undergoes a change in viscosity upon exposure to incident actinic radiation, and

an image-receiving layer including a light-scattering pigment, said image-receiving layer being opaque, but having the capacity to be rendered transparent upon being contacted with said internal phase upon its release from said microcapsule-containing layer following exposure and development,

said microcapsule-containing layer and said image-receiving layer being on the same or separate supports,

wherein one image-wise exposing said microcapsule-containing layer to actinic radiation and rupturing said microcapsules, said internal phase is released from said microcapsules in the image areas and transferred to said image-receiving layer where it renders said image-receiving layer image-wise transparent.

4,508,808

METHOD OF USING DIAZOTYPE PHOTOGRAPHIC MATERIALS WITH PREEXPOSURE TREATMENT TO FORM UNIFORM SITES OF REFRACTIVE INDEX CHANGE

Wai-Hon Lee, Cupertino, and Paul H. Voisin, San Mateo, both of Calif., assignors to Xidex Corporation, Calif.

Filed Nov. 12, 1982, Ser. No. 440,890
Int. Cl.[3] G03C 5/18
U.S. Cl. 430—146 8 Claims

1. A method for preparing a diazotype photoprinting material having an azo dye image thereon, said method comprising:

(a) providing a photoprinting material comprising a base support coated with a dry substantially uniform layer of a composition comprising a light-decomposable diazonium salt, an azo coupler, an acid or alkali-generating neutral stabilizer, and a film-forming binder, said layer further containing a plurality of sites distributed therethrough in substantially uniform manner, said sites having a refractive index substantially different from that of the remainder of said layer;

(b) exposing said photoprinting material in image-wise manner;

(c) permitting substantially all nitrogen gas produced during step (b) to diffuse out of said composition; and

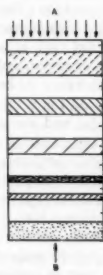
(d) developing said exposed photoprinting material to produce an azo dye image.

4,508,809

PROCESS FOR THE EXPOSURE AND DEVELOPMENT OF PHOTO-GRAPHIC IMAGES AND AN APPARATUS FOR CARRYING OUT THE PROCESS

Immo Boie, Niederkassel; Hermann Lührig, Leverkusen, and Guido Kovacic, Unkel, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 497,087
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220912
Int. Cl.[3] G03C 5/54, 7/00
U.S. Cl. 430—237 3 Claims



1. A process for the exposure and development of photographic images according to the dye diffusion process, using a monosheet material, the laminated structure of such monosheet being divided by a layer which is impermeable to light but permeable to moisture into a photosensitive side of the monosheet capable of image-wise producing diffusible dyes when image-wise exposed to light, and a non-photosensitive side for receiving dyes diffusing from the photosensitive side, and for treatment by an activator or developer solution, thus forming the image-observation side, characterized in that

(a) the monosheet is removably positioned in frame means for holding the edges of the monosheet all round in a light-proof and moisture-tight manner,

(b) the photosensitive side of the monosheet is exposed image-wise to light,

(c) the photosensitive side of the monosheet is then covered by cover means of that frame means for protecting said photosensitive side against light and activator or developer solution during subsequent image-developing,

(d) the non-photosensitive side of the monosheet lies open and with its outer surface is brought into contact with an activator or developer solution in daylight to develop the latent image, so that the image formation takes place visibly,

(e) once the image quality has been achieved, development is stopped by removing the activator or developer solution and by subsequent rinsing, and

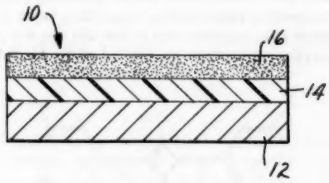
(f) the monosheet is dried.

4,508,810

LIGHT-DESENSITIZABLE TRANSFER MEDIUM WITH PHOTOOXIDIZABLE REACTANT AND OXYGEN-SENSITIZING DYE

Thomas G. Wartman, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 28, 1984, Ser. No. 584,493
Int. Cl.[3] G03C 5/54, 1/72
U.S. Cl. 430—201 9 Claims



1. A transfer medium comprising,

(a) a backing sheet having a uniform face-coating including a volatizable, photooxidizable reactant and an oxygen-sensitizing dye in a film-forming binder, said photooxidizable reactant being capable of inter-reacting with a second reactant material borne on the surface of a receptor sheet at a conversion temperature between about 70° C. and about 150° C. to produce a visibly distinct reaction product, said photooxidizable reactant capable of being desensitized in an image-wise manner upon exposure of the transfer medium to a visible light image pattern,

(b) said face-coating being overcoated with an adhesive coating, said adhesive coating being sufficiently permeable to permit said photooxidizable reactant to migrate therethrough upon exposure to heat, whereby said photooxidizable reactant reacts with said second reactant to form a color, said adhesive coating further being sufficiently permeable to oxygen to allow said photooxidizable reactant to be exposed to sufficient oxygen to be desensitized in an image-wise manner upon exposure to visible light, said adhesive coating being sufficiently tacky to provide close face-to-face contact between said transfer medium and an original and between said transfer medium and said receptor sheet, said adhesive coating further being capable of being stripped away from both said original without affecting the image thereon and said receptor sheet without affecting the image formed thereon, and said adhesive coating being non-reactive with and non-interfering with said photooxidizable reactant and said second reactant material.

7. A copy-sheet system comprising

(a) the transfer medium of claim 1, and

(b) a receptor sheet bearing said second reactant material.

4,508,811

RECORDING ELEMENT HAVING A PYRYLIUM OR THIOPYRYLIUM-SQUARYLIUM DYE LAYER AND NEW PYRYLIUM OR THIOPYRYLIUM-SQUARYLIUM COMPOUNDS

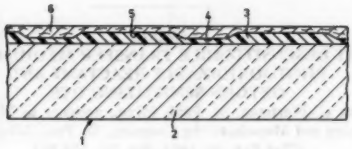
Dirk J. Gravesteijn, Eindhoven, Netherlands; Christiaan Steenbergen, Colorado Springs, Colo.; Jan Van der Veen, and Wilhelmus P. M. Nijssen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,149

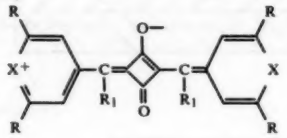
Claims priority, application Netherlands, Jan. 17, 1983, 8300155

Int. Cl.³ G03C 1/78

U.S. Cl. 430—270 4 Claims



1. A recording element in which information can be recorded and read optically and which recording element comprises a supporting plate bearing a recording layer comprising a squarylium dye, characterized in that the dye is a pyrylium- or thiopyrylium-squarylium compound of the formula



wherein

X is an oxygen atom or a sulphur atom,

R is an alkyl group having at least 3 carbon atoms, and

R_1 is a hydrogen atom or a methyl group.

4,508,812

METHOD OF APPLYING POLY(METHACRYLIC ANHYDRIDE RESIST TO A SEMICONDUCTOR

Robert G. Brault, Santa Monica, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed May 3, 1984, Ser. No. 606,506

Int. Cl.³ H01L 21/316

U.S. Cl. 430—270 12 Claims

1. A method of coating a semiconductor wafer with a positive resist of poly(methacrylic anhydride), comprising the steps of:

(a) coating the wafer with a thin layer of poly(t-butyl methacrylate);

(b) heating the pre-coated wafer to a temperature at which the poly(t-butyl methacrylate) is converted to poly(methacrylic anhydride) to form on the surface of the wafer a thin, relatively uniform precursor layer of said anhydride;

(c) applying to said anhydride surface a solution of poly(methacrylic anhydride); and

(d) removing the solvent from said solution so that a uniform coating of the desired thickness of poly(methacrylic anhydride) is obtained upon the precoated surface of the semiconductor wafer.

4,508,813

METHOD FOR PRODUCING NEGATIVE RESIST IMAGES

Takayuki Nakagawa, Shimodate, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 159,520, Jun. 16, 1980, abandoned. This application Oct. 28, 1981, Ser. No. 315,904

Int. Cl.³ G03C 5/00

U.S. Cl. 430—296 8 Claims

1. A method for producing a negative resist image for producing finely patterned microcircuits, said method comprising

exposing a film of a diazo-type resist material consisting essentially a phenol-formaldehyde novolak resin containing about 10% by weight of a naphthoquinone diazide, said resist material being free from 1-hydroxyethyl-2-alkylimidazoline, to electron beam radiation in a predetermined fine pattern corresponding to said image for producing said microcircuits,

heat treating said patternwise exposed resist film,

subjecting said heat treated film to overall exposure to ultraviolet radiation and

developing the so treated film to remove the resist material in the area of said pattern that is not exposed to said electron beam radiation.

4,508,814

WATERLESS NEGATIVE OR POSITIVE LITHOGRAPHIC PRINTING PLATE PREPARATION

Kiyomi Sakurai, Neyagawa, and Seiji Arimatsu, Kyoto, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jul. 8, 1982, Ser. No. 396,476

Claims priority, application Japan, Jul. 9, 1981, 56-107833

Int. Cl.³ G03F 7/08, 7/10, 7/00

U.S. Cl. 430—303 18 Claims

1. A method for preparing a waterless lithographic printing plate with a photosensitive printing plate comprising a support material and a photosensitive layer provided thereon, said photosensitive layer being made of a photosensitive composition comprising a mixture of (a) an emulsion polymerization product of an acrylic or methacrylic monomer having a perfluoroalkyl group in the side chain with or without at least one of other polymerizable monomers, the content of the perfluoroalkyl group-bearing acrylic or methacrylic monomer being not less than 50% by weight, and (b) a film-forming, water-soluble photosensitive substance which is rendered water-insoluble by irradiation with ultra-violet rays in an aqueous medium, the weight proportion of the emulsion polymerization product (a) and the photosensitive substance (b) being 100:0.5–500 in terms of the solid components and the total content of the emulsion polymerization product (a) and the photosensitive substance (b) in the photosensitive composition being from 1 to 50% by weight in terms of the solid components, which comprises the steps of (1) placing an original image film on the photosensitive layer, (2) irradiating ultraviolet rays thereto, (3) separating the irradiated plate from the image film, (4) treating the separated plate with water for washing out the photosensitive composition at the non-exposed part to make the non-exposed part as imaged and the exposed part as non-imaged, thereby producing a positive type printing plate and (5) inking the surface of the printing plate with a lithographic ink so that the ink adheres to the substrate, but does not substantially adhere to the exposed non-image part; said film-forming substance (b) being used in such small amounts in the mixture relative to component (a) that the exposed portion acquires lithographic ink repellant properties when said lithographic ink is applied to the surface thereof.

2. In a method for preparing a waterless lithographic printing plate with a photosensitive printing plate comprising a support material and a photosensitive layer provided thereon, said photosensitive layer being made of a photosensitive composition comprising a mixture of (a) an emulsion polymerization product of an acrylic or methacrylic monomer having a perfluoroalkyl group in the side chain with or without at least

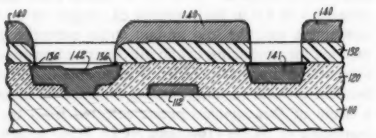
one of other polymerizable monomers, the content of the perfluoroalkyl group-bearing acrylic or methacrylic monomer being not less than 50% by weight, and (b) a film-forming, water-soluble photosensitive substance which is rendered water-insoluble by irradiation with ultra-violet rays in an aqueous medium, the weight proportion of the emulsion polymerization product (a) and the photosensitive substance (b) being 100:0.5–500 in terms of the solid components and the total content of the emulsion polymerization product (a) and the photosensitive substance (b) in the photosensitive composition being from 1 from 50% by weight in terms of the solid components, which comprises the steps of (1) placing an original image film on the photosensitive layer, (2) irradiating ultraviolet rays thereto, (3) separating the irradiated plate from the image film and (4') treating the separated plate with water for extracting the photosensitive substance in the photosensitive composition at the non-exposed part to make the exposed part as imaged and the non-exposed part as non-imaged, thereby producing a negative type printing plate, said film-forming substance (b) being used in large amounts relative to component (a) such that the exposed portion becomes the lithographic ink accepting part, when a lithographic ink is applied to the surface thereof.

4,508,815

RECESSED METALLIZATION

Paul W. Ackmann, Lewisville, and Frank R. Bryant, Denton, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Nov. 3, 1983, Ser. No. 548,465
Int. Cl.³ H01L *21/312, 21/283*
U.S. Cl. 430—314 **4 Claims**



1. A method of forming a patterned layer of conductor on an integrated circuit comprising the steps of:

depositing a first dielectric layer of predetermined dielectric thickness above at least one lower layer;

depositing a contact layer of photoresist above said dielectric layer;

exposing and developing said contact photoresist to form at least one contact aperture in said contact photoresist;

removing that portion of said dielectric lying below said at least one contact aperture to a first contact depth; and

stripping said contact photoresist;

depositing a layer of conductor photoresist having a predetermined conductor photoresist thickness above said dielectric layer;

exposing and developing said conductor photoresist to form at least one conductor aperture, overlapping said at least one contact aperture, in an overlap region, in said photoresist and a remainder portion of said photoresist outside said at least one conductor aperture;

removing that portion of said dielectric lying below said at least one conductor aperture to a predetermined channel depth, thereby forming at least one channel having first and second sides in said dielectric, and also simultaneously removing a portion of dielectric in said overlap region to a second contact depth;

depositing a layer of conductor over said integrated circuit, said layer of conductor having a predetermined conductor thickness substantially equal to said predetermined channel depth, so that a portion of said layer of metal penetrates said overlap region and penetrates said channel to abut said first and second sides and so that said layer of conductor is discontinuous between said at least one channel and said remainder of said photoresist; and

lifting off chemically said remainder of said photoresist, thereby leaving a patterned layer of conductor embedded in said at least one channel in said dielectric layer.

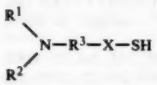
4,508,816

METHOD FOR BLEACHING COLOR PHOTOSENSITIVE MATERIAL

Kiyohiko Yamamuro; Shigeo Hirano; Isamu Itoh, and Yasuo Iwasa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 21, 1983, Ser. No. 544,155
Claims priority, application Japan, Oct. 21, 1982, 57-185680; Jan. 11, 1983, 58-2522
Int. Cl.³ G03C *7/00, 5/44*
U.S. Cl. 430—393 **23 Claims**

1. A method for bleaching a color photosensitive material, which comprises exposing imagewise a silver halide color photosensitive material, performing color development, and bleaching the color photosensitive material with a processing solution containing a persulfate, said silver halide color photosensitive material containing at least one compound selected from the group consisting of the compounds represented by formula I, salts thereof, and precursors thereof which cleaves under an acid or alkaline processing solution to form a compound represented by the formula I:



Formula I

where R^1 and R^2 each independently represents a hydrogen atom, an aliphatic group, or R^1 and R^2 together form a ring together with the N atom; R^3 represents $—R^4—$ or $—R^4—S—$, said $—R^4—$ being a divalent aliphatic group; and X represents a divalent heterocyclic ring group containing at least one atom selected from the group consisting of a nitrogen atom, an oxygen atom, and a sulfur atom.

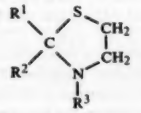
4,508,817

METHOD OF COLOR PHOTOGRAPHIC PROCESSING

Shigeru Ohno, and Shinzo Kishimoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 21, 1984, Ser. No. 612,173
Claims priority, application Japan, May 20, 1983, 58-88938
Int. Cl.³ G03C *7/00*
U.S. Cl. 430—393 **10 Claims**

1. A method of color photographic processing which comprises color developing an exposed silver halide color photographic light-sensitive material and thereafter carrying out a bleach treatment and a fix treatment or a bleach-fix treatment, wherein the bleaching agent used for the bleach treatment or the bleach-fix treatment is a ferric ion complex salt or a persulfate and the bleaching bath or the bleach-fixing bath or a prebath therefor contains at least one compound represented by the following formula (I):



(I)

wherein R^1 and R^2 represent each a hydrogen atom, an alkyl group which may be substituted, a phenyl group which may be substituted or a heterocyclic group which may be substituted, and R^3 represents a hydrogen atom or a lower alkyl group which may be substituted.

4,508,818

SILVER HALIDE PHOTOGRAPHIC SENSITIVE MATERIALS

Masashi Ogawa; Kunio Ishigaki; Nobuyuki Iwasaki, and Taku Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 391,663, Jun. 24, 1982, abandoned.
This application Mar. 26, 1984, Ser. No. 592,763
Claims priority, application Japan, Jun. 24, 1981, 56-97998
Int. Cl.[3] G03C *1/76, 1/30*
U.S. Cl. 430—523 23 Claims

1. A silver halide photographic sensitive material, comprising:

a support base;

a sensitive silver halide emulsion layer on the support base;

a first insensitive layer positioned on the silver halide emulsion layer; and

a second insensitive layer positioned on the first insensitive layer, wherein the second insensitive layer has a melting time higher than the first insensitive layer which has a melting time equal to or higher than that of the silver halide emulsion layer, wherein the second insensitive layer is hardened with a non-diffusible polymeric hardener.

4,508,819

METHOD FOR CULTURING CELLS OR TISSUES

Sam Rose, Eggertsville, N.Y., assignor to Bio-Response, Inc., Wilton, Conn.

Continuation of Ser. No. 287,032, Jul. 27, 1981, , which is a continuation of Ser. No. 59,497, Jul. 23, 1979, abandoned, which is a division of Ser. No. 851,744, Nov. 15, 1977, Pat. No. 4,189,470, which is a division of Ser. No. 549,985, Feb. 11, 1975, Pat. No. 4,064,006, which is a division of Ser. No. 349,330, Apr. 9, 1973, Pat. No. 3,964,467, which is a continuation-in-part of Ser. No. 328,048, Jan. 30, 1973, Pat. No. 3,857,393, which is a division of Ser. No. 136,467, Apr. 22, 1971, Pat. No. 3,719,182.
This application May 21, 1982, Ser. No. 380,960
Int. Cl.[3] A01N *1/02*
U.S. Cl. 435—1 12 Claims

1. A method for the in vitro culturing of cells or tissues in an environment which simulates the in vivo environment in which said cells or tissues normally grow such that said cells or tissues grow, behave and function in substantially the manner as said cells or tissues grow, behave and function in vivo, comprising contacting said cells or tissues with flowing, cell-free lymph.

4,508,820

METHOD FOR SIMULTANEOUSLY MONITORING TURNOVER RATE IN MULTIPLE PROTEINS

Carl R. Merril, Rockville, and David Goldman, Gaithersburg, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 407,762, Aug. 13, 1982, abandoned.
This application Feb. 27, 1984, Ser. No. 582,862
Int. Cl.[3] C12Q *1/29, 1/16;* G01T *1/00*
U.S. Cl. 435—29 4 Claims

1. In a method for determining polypeptide turnover rates of the type wherein radiolabelled proteins in a protein mixture extracted from a sample incubated with radioactive labelled amino acids are separated from the protein mixture, the improvement comprising employing ^{14}C-labelled amino acids as the radioactive label for the synthesis of said proteins, silver staining the separated proteins and determining turnover rate by the amount of radioactive amino acid incorporated into protein per unit time/total protein.

4,508,821

DETECTION OF WHITE CELL ASSOCIATED BACTERIA WITH A FLUORESCENT DYE

James D. Mansour, Raleigh, and Thomas Schulte, Cary, both of N.C., assignors to Becton Dickinson and Company, Paramus, N.J.

Filed Jul. 5, 1983, Ser. No. 510,537
Int. Cl.[3] C12Q *1/04, 1/06*
U.S. Cl. 435—34 29 Claims

1. A method for the detection of bacteria including intracellular bacteria comprising staining said bacteria with ethidium bromide, applying excitation light to said bacteria, and observing said bacteria for fluorescence prior to the appearance of fluorescence from any substantial number of leukocyte nuclei.

4,508,822

BIOCHEMICAL PROCESS

Stephen C. Taylor, Hawarden, Wales, assignor to Imperial Chemical Industries, PLC, London, England

Filed Oct. 6, 1982, Ser. No. 433,093
Claims priority, application United Kingdom, Oct. 6, 1981, 8130116
Int. Cl.[3] C12P *7/02;* C12N *1/26, 15/00, 1/20*
U.S. Cl. 435—155 6 Claims

1. A process for the production of a compound comprising a 1,2-dihydroxycyclohexa-3,5-diene ring which process comprises the steps of:

(1) growing a mutant strain in a growth medium at a temperature in the range 25° C. to 35° C. and at a pH within the range 5.5 to 8.0 in the presence of oxygen or an oxygen containing gas, the said mutant strain comprising (a) an enzyme for producing cyclic dihydroxy compounds from aromatic compounds; (b) being incapable of growing on benzene or toluene, and (c) being obtained by mutation of a strain of *Pseudomonas putida* selected from the group consisting of NCIB 11680 and NCIB 11767 which is able to grow on benzene or toluene, the said growth medium comprising an aqueous mineral salts solution and a suitable source of carbon for cell growth, the concentration of said source being maintained between 1% w/w and 5% w/w;

(2) supplying to the cells of the said mutant strain suspended in a suitable medium, after the growth period, an aromatic compound and a compound which functions as a source of energy for metabolising the aromatic compound, the said suitable medium being capable of supporting little or no growth of the cells of the said mutant strain and lacking, or containing little of, one or more elements essential for growth, of the cells of said strain the said aromatic compound having one or more aromatic rings, each of which may bear one or more substituents which may be hydrocarbyl groups having up to four carbon atoms, or heteroatoms or hetero-groups, at least one of the said one or more aromatic rings having a hydrogen atom attached to adjacent carbon atoms in the aromatic rings, the concentration of the said source of energy in the said suitable medium being maintained at between 0.05% w/v and 0.5% w/v, and the concentration of the said cells in the said suitable medium being from 1 to 30 grams dry weight of cells per liter of medium;

(3) allowing the said mutant strain to convert the aromatic compound into a compound comprising a 1,2-dihydroxycyclohexa-3,5-diene ring at an oxygen tension which is greater than 1% of saturation;

(4) removing the said cells by centrifugration, flocculation or both; and

(5) isolating the compound comprising (a) 1,2-dihydroxycyclohexa-3,5-diene ring from the medium.

4,508,823

GENE SPLICING METHOD AND PRODUCTS PRODUCED THEREFROM

Ronald H. Olsen, Ann Arbor, Mich., assignor to Microlife Technics, Inc., Sarasota, Fla.

Continuation-in-part of Ser. No. 147,563, May 8, 1980, Pat. No. 4,374,200. This application Dec. 9, 1981, Ser. No. 328,957

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.[3] **C12N** *15/00, 1/20, 1/00;* **C12P** *21/00, 19/34;* **C12R** *1/38, 1/385*

U.S. Cl. 435—172.3 **16 Claims**

1. In a gene splicing method wherein chromosomal DNA is partially and randomly cleaved into fragments with a restriction enzyme and spliced into a cleaved vector thereby joining the chromosomal DNA fragments to the vector to form a recombinant plasmid, the improvement which comprises:

(a) mechanically fragmenting concentrated chromosomal DNA in the absence of bacterial cells into multiple fragments of randomly varying lengths, wherein the average length of the fragments is between 0.1 and 20×10^6 daltons;

(b) partially cleaving with a restriction enzyme the mechanically fragmented and cleaved chromosomal DNA; and

(c) joining the endonuclease cleaved mechanically fragmented DNA with an endonuclease cleaved vector selected from derivatives of pRO1600 as carried in NRRL-B-12124 to form a bank of recombinant plasmids of varying sizes, wherein the bank contains intact alleles which are usually cleaved by the restriction endonuclease.

4,508,824

PSEUDOMONAS DEGRADATION OF HYDROCARBONS

Ronald H. Olsen, Ann Arbor, Mich., assignor to Microlife Technics, Inc., Sarasota, Fla.

Continuation-in-part of Ser. No. 147,563, May 8, 1980, Pat. No. 4,374,200. This application Oct. 22, 1982, Ser. No. 436,077

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.[3] **C12N** *15/00, 1/20, 1/00;* **C12P** *19/34;* **C12R** *1/38*

U.S. Cl. 435—172.3 **11 Claims**

1. In a method of introducing hydrocarbon degradation encoding metabolic plasmids into a bacterium of the genus Pseudomonas by transconjugal mating to transmit the plasmid of a donor bacterium to a recipient bacterium to produce a transconjugant bacterium containing the metabolic plasmid, wherein the recipient and donor bacterium are each different nutrient factor auxotrophs the improvement which comprises:

(a) providing a donor bacterium containing (1) a plasmid derivative of pRO1600 as carried in NRRL-B-12124 and (2) at least one first series hydrocarbon degradation encoding metabolic plasmid wherein each metabolic plasmid derives energy from different hydrocarbons;

(b) mating the donor bacterium with a recipient bacterium to produce a first transconjugant bacterium without the pRO1600 plasmid derivative and with the metabolic plasmid; and

(c) growing the transconjugant bacterium with the nutrient factor required by the recipient bacterium without the nutrient factor required by the donor bacterium so as to isolate the first transconjugant bacterium with the metabolic plasmid of the donor bacterium.

4,508,825

METHOD FOR THE SEPARATION OF EXTRACELLULAR AMYLASE AND PROTEASE PRODUCED DURING THE FERMENTATION OF ENZYME PRODUCING MICROORGANISMS

Chong Y. Kim; Terry F. Farver, and Jack W. Brewer, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 30, 1983, Ser. No. 480,245

Int. Cl.[3] **C12N** *9/26, 9/50;* **C12R** *1/07*

U.S. Cl. 435—201 **12 Claims**

1. In combination with the method of fermenting an enzyme producing microorganism capable of producing protease and amylase to produce a fermentation broth containing extracellular protease and amylase and filtering this broth to provide a cell-free filtrate containing these enzymes, the improvement which comprises the steps of:

(a) adding low molecular weight polyethyleneglycol and a high molecular weight cationic polymer selected from the group of epihalohydrin/polyamine copolymers and dextran or a mixture thereof of the filtrate;

(b) providing sufficient agitation to mix the two polymers and the filtrate and allowing phase separation to occur between the polyethyleneglycol containing phase and the epihalohydrin/polyamine copolymer or dextran containing phase to provide a polyethyleneglycol containing phase rich in protease relative to amylase and an epihalohydrin/polyamine copolymer or dextran containing phase rich in amylase relative to protease;

(c) separating the phases formed in step (b);

(d) recovering the enzymes in the polyethyleneglycol containing phase to provide a protease/amylase product rich in protease; and/or

(e) recovering the enzymes in the epihalohydrin/polyamine copolymer or dextran containing phase to provide a protease/amylase product which is rich in amylase.

4,508,826

BACTERIOPHAGE DNA CLONING VECTOR TG1 AND MICROORGANISMS CONTAINING TG1

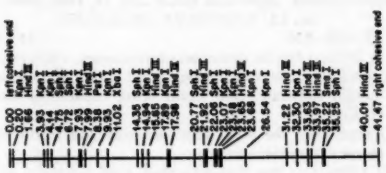
Forrest Foor, New York, N.Y., and Gary P. Roberts, Fanwood, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 368,544, Apr. 15, 1982, abandoned. This application Mar. 8, 1983, Ser. No. 471,579

Int. Cl.[3] **C12N** *7/00, 7/02, 15/00, 1/20, 1/00*

U.S. Cl. 435—235 **5 Claims**

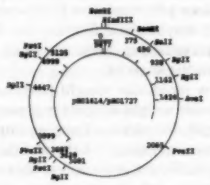
– Restriction Map of Phage TG1


left cohesive end
Kpn I
Hind III
Xho I
Sal I
Xba I
Pst I
Sma I
Bam H I
Nru I
Eco R I
Sph I
Hind III
Kpn I
Sma I
Bam H I
Xba I
Sal I
Pst I
Eco R I
Nru I
Hind III
Kpn I
Sac I
Sac II
Eco R I
Hind III
Kpn I
Sac I
Sac II
Eco R I
Hind III
Xho I
Sma I
Bam H I
Xba I
Sal I
Pst I
Eco R I
Nru

4,508,827
MOLECULAR CLONING VECTORS FOR USE IN GRAM-NEGATIVE BACTERIA

Ronald H. Olsen, Ann Arbor, Mich., assignor to Microlife Technics, Inc., Sarasota, Fla.

Continuation-in-part of Ser. No. 147,563, May 8, 1980, Pat. No. 4,374,200. This application Jan. 31, 1983, Ser. No. 462,630
The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.
Int. Cl.[3] **C12N** *1/20, 1/00, 15/00;* **C12P** *21/00, 19/34, 21/02;* **C12R** *1/385*
U.S. Cl. 435—253 **7 Claims**



1. The plasmid pRO1727 ligated to other deoxyribonucleic acid segments.

3. The plasmid pRO1729 ligated to other deoxyribonucleic acid segments.

4,508,828
BIOASSAY OF PARATHYROID HORMONE

Arnold W. Lindall, Marine-on-St. Croix, and James J. Elting, North Oaks, both of Minn., assignors to Immuno Nuclear Corporation, Stillwater, Minn.

Filed Mar. 21, 1983, Ser. No. 477,253
Int. Cl.[3] **G01N** *33/56, 33/58, 33/60*
U.S. Cl. 436—500 **18 Claims**

1. A method of bioassay of mammalian parathyroid peptides in biological or other fluids comprising:

extracting from a measured volume of the biological or other fluid, with a support-antibody matrix specific to the N-terminal region of mammalian parathyroid hormone, mammalian parathyroid peptides to which the matrix is specific;

contacting the extracted mammalian parathyroid peptides with cultured animal tissue, cultured animal cells, or tissue extract containing adenylate cyclase-coupled parathyroid hormone receptors in a measured volume of medium and under conditions suitable for the extracted mammalian parathyroid peptides to bind the parathyroid hormone receptors; and

measuring the response to binding of the parathyroid hormone receptors.

4,508,829
METHOD AND KIT FOR PREGNANCY DETECTION

Bernard Sulitzeanu, Jerusalem, Israel, assignor to Teva Pharmaceutical Industries Ltd., Israel

Filed Aug. 18, 1982, Ser. No. 409,053
Claims priority, application Israel, Sep. 16, 1981, 63855
Int. Cl.[3] **G01N** *33/54, 33/58, 33/76*
U.S. Cl. 436—510 **14 Claims**

1. A method for the detection of pregnancy, comprising:

(i) contacting urine of a female subject with a lectin bound to a solid substrate, said lectin being capable of binding HCG;

(ii) separating the solid substrate with the lectin bound thereto from the urine;

(iii) contacting the thus-separated solid substrate with a liquid reagent comprising a carrier material of killed and stained Staphylococci bacteria suspended therein and having anti-HCG antibodies bound to said bacteria, said bacteria with anti-HCG antibodies bound thereto constituting a colour reagent; and

(iv) separating any excess colour reagent from the lectin substrate,

whereby any HCG in the urine will be bound to said anti-HCG antibodies bound to said bacteria to thus colour said lectin substrate, thus indicating that the subject is pregnant,

while no HCG in the urine results in no binding of said anti-HCG antibodies to said lectin substrate and thus in no colouring of said lectin substrate, thus indicating that the subject is not pregnant.

8. A kit for detecting pregnancy, comprising the following separately contained components:

(A) a colour reagent comprising a suspension in a liquid of killed and stained Staphylococci bacteria, said bacteria having bound thereto anti-HCG antibodies; and

(B) at least one column packed with a solid substrate to which lectin is bound.

14. A colour reagent for binding to HCG, to detect pregnancy, said colour reagent being in the form of a liquid suspension, and comprising

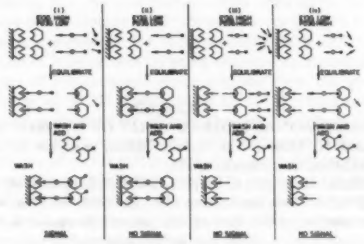
killed and stained *Staphylococci bacteria,* and

anti-HCG antibodies bound to said bacteria.

4,508,830
ASSAY

Terence S. Baker, 70 Welley Rd., Wraysbrugy, Staines, Middlesex, TW19 5EP, England, and William F. Couslon, 1 Grayson's Close, Rayleigh, Essex, England

Filed Feb. 7, 1983, Ser. No. 464,143
Claims priority, application United kingdom, Feb. 10, 1982, 8203906
Int. Cl.[3] **G01N** *33/54*
U.S. Cl. 436—510 **14 Claims**



1. An assay involving the following components;

a sample solution containing a first and a second antigenic solute;

a first antibody capable of reversibly binding to a determinant of the first antigenic solute, the first antibody being in solution;

a second antibody capable of reversibly binding to a determinant of the second antigenic solute, the second antibody being irreversibly bound to a solid phase support;

a ligand molecule comprising a first antigen to which the first antibody is capable of reversibly binding and a second antigen to which the second antibody is capable of reversibly binding, the first and second antigens being irreversibly bound together through a bridging support molecule, the ligand molecule being in solution; and

a labelled antibody capable of reversibly binding to the antigen,

the assay comprising the steps of;

forming a mixture of the sample solution, the first antibody, the second antibody and the ligand molecule, provided that the first antibody, the second antibody and the ligand molecule are not all mixed with each other prior to admixture of the sample solution;

incubating the said mixture, thereby allowing competition between the ligand molecule and the first antigenic solute for association with the first antibody and allowing competition between the ligand molecule and the second antigenic solute for association with the second antibody;

placing the solid phase support in contact with the labelled antibody, thereby allowing association between the labelled antibody and any unbound first antigen; and

determining the amount of labelled antibody bound to the solid phase support through the ligand molecule and the second antibody.

4,508,831

ANTI-STREPTOLYSIN O LATEX REAGENT AND PROCESS FOR THE PREPARATION THEREOF

Tibor Toth, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,128

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210080

Int. Cl.³ G01N *33/54*

U.S. Cl. 436—512 **20 Claims**

1. A process for the preparation of an antistreptolysin O latex reagent, which comprises reacting streptolysin O with a bifunctional low molecular weight compound to form a product and adsorbing said product to latex particles.

4,508,832

ELLIPSOMETRICALLY MEASURING RATE OF OPTICAL CHANGE IN IMMUNOASSAY

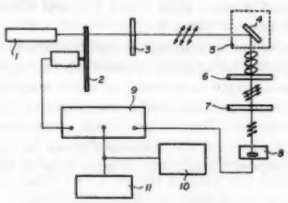
Timothy J. N. Carter, Geneva, and Claus Dähne, Onex, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Filed Jun. 18, 1982, Ser. No. 389,973

Claims priority, application European Pat. Off., Jun. 22, 1981, 81 81 0255.0

Int. Cl.³ G01N *33/54, 21/17, 21/21*

U.S. Cl. 436—517 **6 Claims**



1. A bioassay method for determining a bioactive substance in a sample by the reaction of said bioactive substance, antigen A_G or antibody A_B, with its specific binding partner, antibody A_B or antigen A_G, respectively, which comprises contacting with the sample to be determined a transparent dielectric substrate the surface of which is at least partly coated with a film of or containing A_B or A_G, respectively distributed on the surface of said transparent dielectric substrate, el'ipsometrically measuring the rate of optical change occurring in a beam of light where reflection takes place at the boundary line between substrate surface and film as the result of the reaction of A_B and the A_G of the sample, then correlating the rate data thus obtained with standard rate data from identical rate measurements done with known standard samples of A_G or A_B, respectively.

4,508,833

SEPARATION OF INTERLEUKIN-2 FROM PHYTOHEMAGGLUTININ BY DYE MATRIX CHROMATOGRAPHY

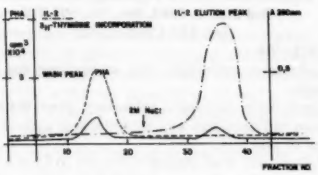
Hans H. Sonneborn, Heusenstamm; Udo Schwulera, Bad-Vilbel, and Hans Schleussner, Frankfurt, all of Fed. Rep. of Germany, assignors to Biotest-Serum-Institut GmbH, Frankfurt, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,708

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149360

Int. Cl.³ G01N *31/08*; A61K *37/02*; B01D *15/08*

U.S. Cl. 436—543 **6 Claims**



1. A method of purifying human interleukin-2 comprising passing crude interleukin-2 extract through a group-selective dye-ligand adsorption chromatographic column containing a matrix-gel medium consisting of a Blue A ligand or variant thereof or of a Green A ligand in a concentration of approximately 1.5 to 3.0 mg/ml of expanded matrix at a pH of approximately 6.8 to 8.5, a temperature of approximately 4° to 40° C., and a flowthrough rate of approximately 10 to 100 ml/h, and eluting purified interleukin-2 from the medium.

4,508,834

SPECTACLE GLASS WITH INCREASED REFRACTIVE INDEX

Georg Gliemeroth, Mainz-Finthen; Ludwig Ross, Klein-Winternheim; Burkhard Speit, Mainz-Momback; Volkmar Geiler, Mainz-Finthen; Hans-Georg Krolla, Mainz, and Lothar Meckel, Oestrich-Winkel, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Feb. 10, 1983, Ser. No. 465,410

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204625

Int. Cl.³ C03C *3/04, 3/02, 3/16*

U.S. Cl. 501—73 **9 Claims**

1. An alumina-silica-phosphate spectacle glass which is colorless in the visible range, has a density of less than about 2.65 gcm^{-3}, an Abbe number equal to or greater than about 45 and a refractive index n_d greater than about 1.56, and consisting essentially of (in % by weight):

P_2O_5	12 to 40
Al_2O_3	13 to 34
SiO_2	8 to 30
Total of P_2O_5, Al_2O_3 and SiO_2	47 to 87
B_2O_3	0 to 16
ZrO_2	0 to 4
TiO_2	3 to 12
Total of ZrO_2 and TiO_2	4 to 12
CaO	2 to 18
MgO	0 to 4
Total of CaO and MgO	2 to 18
Na_2O	0 to 15
K_2O	0 to 11
Total of Na_2O and K_2O	4 to 15
Li_2O	0 to 6
Nb_2O_5	0 to 12
ZnO	0 to 8

-continued

Refining agent oxides U.V. absorption agent oxides, and other properties adjustment oxides	0 to 12.

4,508,835

VIBRATABLE REFRACTORY MIX AND BINDER THEREFOR

John A. Kaniuk, State College, Pa.; William E. Meinking, Alfred, and Jeffrey R. Morris, Scio, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 8, 1983, Ser. No. 502,076

Int. Cl.³ C04B *35/02*

U.S. Cl. 501—94 **23 Claims**

1. A vibratable refractory mix comprising the following components:

(a) a particulate, non-basic refractory grain material in an amount sufficient and a sizing suitable to provide refractoriness to said mix,

(b) a P_2O_5 source in an amount sufficient to form a bond with said non-basic refractory material,

(c) a non-clay containing binder which comprises a blend of a member selected from the group consisting of a cellulose ether, microcrystalline cellulose and polyvinyl alcohol in an amount sufficient to provide slump resistance to said mix after it has been vibrated into a form and the form is removed, and a dry, colloidal, particulate material in an amount sufficient to reduce phosphate migration in said mix, after it has been vibrated into a form and cured by heating, to a maximum acceptable level to achieve satisfactory integrity of the molded refractory product, and

(d) water in an amount sufficient to provide lubricity to said mix and make it vibratable, but not in an amount which would adversely affect the slump resistance of said mix after it has been vibrated into a form.

4,508,836

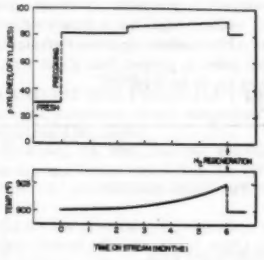
CATALYTIC CONVERSION PROCESS FOR AROMATIC FEEDSTOCKS WITH HYDROGEN REGENERATION OF COKE-SELECTIVATED ZEOLITE CATALYST

Werner O. Haag, Lawrenceville; David H. Olson, Pennington, and Paul G. Rodewald, Rocky Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,822

Int. Cl.³ B01J *29/38*; C07C *2/66, 5/22*

U.S. Cl. 502—53 **17 Claims**



1. A process for catalytically converting an organic feedstock by alkylation, disproportionation and/or isomerization comprising at least one aromatic compound by contacting the feedstock under catalytic conversion conditions with a catalyst comprising a crystalline aluminosilicate zeolite characterized by a silica to alumina mole ratio of at least about 12 and a constraint index within the approximate range of 1 to 12, which catalyst has undergone controlled precoking by contact with a thermally decomposable organic compound at a temperature in excess of the decomposition temperature of said compound but less than about 1200° F. at a hydrogen to organic compound mole ratio of between 0 to 1 to deposit at least about 1 weight percent of coke thereon and using the thus precoked catalyst in conversion of said feedstock to a product comprising at least one mononuclear alkyl-aromatic compound under conditions of lesser severity which include at least one variable of a lower temperature or a higher hydrogen concentration than employed during the aforesaid precoking with consequent loss in conversion activity of said catalyst and thereafter effecting regeneration of the aged catalyst by exposure to an atmosphere comprising hydrogen at a temperature between about 800° F. and about 1200° F. and a pressure between about 0 and about 2000 psig for a period of time sufficient to at least partially restore the activity of the catalyst.

14. In the process of converting an aromatic feedstock by alkylation, disproportionation and/or isomerization to an alkyl-substituted mono-nuclear aromatic product by contacting the feedstock with a coke-selectivated ZSM-5 type zeolite catalyst at elevated temperature under conversion conditions to produce said alkyl-substituted mononuclear aromatic product, the improvement which comprises:

regenerating the process coked catalyst in contact with a non-oxidizing atomsphere comprising an effective amount of hydrogen at elevated temperature to restore activity of the catalyst while retaining selectivity.

15. The process of claim 14 wherein the regeneration is conducted at a temperature of about 800° F. to 1200° F. and the aromatic product comprises para lower di-alkyl benzene.

4,508,837

ZEOLITE SSZ-16

Stacey I. Zones, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 28, 1982, Ser. No. 425,786

Int. Cl.³ C01B *33/26*; B01J *29/28*

U.S. Cl. 502—62 **10 Claims**

1. A zeolite having a mole ratio of an oxide selected from silicon oxide, germanium oxide and mixtures thereof to an oxide selected from aluminum oxide, gallium oxide, and mixtures thereof greater than about 5:1, and having the X-ray diffraction lines of Table 1.

9. A method for preparing the zeolite of claim 1, comprising:

(a) preparing an aqueous mixture containing sources of an organonitrogen compound, an oxide selected from aluminum oxide, gallium oxide, and mixtures thereof, and an oxide selected from silicon oxide, germanium oxide, and mixtures thereof, the aqueous mixture having the following composition in terms of mole ratio of oxides:

YO_2/W_2O_3=5-350

M_2O/W_2O_3=0.5-20

R_2O/W_2O_3=0.5-40

MCl/W_2O_3=20-200

wherein Y is silicon, germanium or mixtures thereof, W is aluminum, gallium or mixtures thereof, M is an alkali metal, and R is a 1,4-di(1-azoniabicyclo[2.2.2]octane)butyl dihalide, and wherein said aqueous mixture has a mole ratio of OH^-/YO_2 of greater than 0.95;

(b) maintaining the mixture at a temperature of from about 100° C. to about 235° C. until the crystals of said zeolite form; and

(c) recovering said crystals.

4,508,838

COMPOSITIONS CONTAINING THIOLATES FOR REMOVAL OF HEAVY METAL IONS FROM DILUTE AQUEOUS SOLUTIONS

Hans Buckl, Freising, Fed. Rep. of Germany, assignor to Süd Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 19, 1983, Ser. No. 524,786

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1982, 3231982

Int. Cl.[3] B01J *20/12, 20/18*

U.S. Cl. 502—62 13 Claims

1. A composition, comprising a thiol-treated sorption complex, for the removal of heavy metal ions from dilute solutions, which comprises:

A. a thiolate having two or more —SMe— groups, wherein Me represents an alkali or ammonium; and

B. a swellable silicate whose ion exchange capacity is 5–350 meq/100 g.

2. A composition, as defined in claim 1, in which said thiolate is derived from a heterocyclic dithiol.

3. A composition, as defined in claim 1, in which said thiolate is derived from a heterocyclic trithiol.

4. A composition, as defined in claim 3, in which the thiol is derived from trimercaptotriazine.

11. A substance, as defined in claim 1, characterized in that the silicate represents a mixture of a bentonite, kaolinite, and a zeolite mineral.

4,508,839

CATALYST FOR THE CONVERSION OF CARBO-METALLIC CONTAINING OILS

Oliver J. Zandona, Ashland; William P. Hettinger, Jr., Russell; Stephen M. Kovach, Ashland, and Hubert W. Beck, Russell, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 27, 1981, Ser. No. 296,679

Int. Cl.[3] B01J *29/08*

U.S. Cl. 502—65 2 Claims

1. A catalyst composition for cracking hydrocarbons boiling above 650° F. and comprising carbo-metallic impurities of naphthenes and asphaltenes comprising at least about 35 wt % of a calcined rare earth exchanged "Y" crystalline faujasite dispersed in a clay containing matrix material, said catalyst composition providing a pore volume of at least 0.35 cc/g, a matrix material providing a substantial amount of pore size openings within the range of 500 to 2000 A, said catalyst composition comprising a residual sodium content of less than 0.30 wt % and said catalyst composition being rare earth exchanged during preparation to provide a lanthanum to cerium ratio greater than 1.3:1.

4,508,840

METHOD OF PREPARING A HIGH-DENSITY CRACKING CATALYST WITH REDUCED SULFUR EMISSIONS FROM COKE

William E. Cormier, Jr., Clarksboro; Gary M. Pasquale, Sewell, and William A. Stover, Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 30, 1982, Ser. No. 403,691

Int. Cl.[3] B01J *29/08*

U.S. Cl. 502—70 11 Claims

1. A method of preparing a high-density cracking catalyst with reduced sulfur emmissions from coke, said catalyst comprising active catalytic crystalline aluminosilicate zeolite fines dispersed in an amorphous matrix, said method consisting essentially of the steps of mixing a basic solution containing silica with an acidic solution containing alumina, adding to the mixture said active catalytic zeolite fines, continuously maintaining said mixture at a pH of about 3.0 to about 4.5 from initial mixing to the formation of a gel matrix, homogenizing the gel matrix and spray drying the homogenized gel.

4,508,841

PROCESS FOR PRODUCING POROUS REFRACTORY INORGANIC OXIDE PRODUCTS

Kazuhiko Onuma, Machida; Yoichi Kageyama, Isehara; Hiromu Kobayashi, Yokohama; Akihiro Matsuki, Yokohama, and Makoto Suzuki, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd. and Asia Oil Company, Limited, both of Tokyo, Japan

Filed Jan. 19, 1982, Ser. No. 340,763

Claims priority, application Japan, Jan. 19, 1981, 56-6147; Jan. 19, 1981, 56-17759; Mar. 2, 1981, 56-29699; Apr. 8, 1981, 56-52730; Dec. 9, 1981, 56-198014

Int. Cl.[3] B01J *29/00;* C01F *7/02*

U.S. Cl. 502—73 13 Claims

1. A process for producing a catalyst or catalyst carrier, which comprises:

shaping a mixture comprising at least one inorganic member selected from the group consisting of alumina hydrate and mixtures of alumina hydrate with other refractory inorganic oxide, and from about 20 to 80 wt.%, based on the total oxide content of said mixture, of carbon black, wherein said carbon black aids in the formation of controlled pores in the catalyst or catalyst carrier whereby a shaped product is obtained;

drying the shaped product without sintering; and

firing the dried shaped product in an oxygen-containing gas flow, wherein the carbon black is burned off and a porous refractory inorganic oxide catalyst or catalyst carrier containing alumina is formed having a specific surface area ranging from 30 to 350 m^2/g and a total pore capacity of pores between 37.5 Å and 75,000 Å in radius ranging from 0.6 to 1.5 cc/g wherein the pore capacity of pores between 37.5 Å and 500 Å in radius is 90% or more of the total pore capacity, said catalyst or catalyst carrier also having two peak pore distributions, one being between 40 Å and 100 Å in radius and the other being between 100 Å and 500 Å in radius with a pore capacity of pores between 37.5 Å and 100 Å in radius of 0.45 cc/g or more and a pore capacity of pores between 100 Å and 500 Å in radius of 0.1 cc/g or more.

4,508,842

ETHYLENE POLYMERIZATION USING SUPPORTED VANADIUM CATALYST

Debra L. Beran, Crosslanes, W. Va.; Kevin J. Cann, Belle Mead, N.J.; Robert J. Jorgensen, Dunbar, W. Va.; Frederick J. Karol, Belle Mead; Norma J. Maraschin, Somerset, both of N.J., and Arthur E. Marcinkowsky, Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 29, 1983, Ser. No. 480,297

Int. Cl.[3] C08F *4/68*

U.S. Cl. 502—112 5 Claims

1. A supported catalyst precursor for producing polyethylene consisting essentially of:

(1) a vanadium compound which is the reaction product of:

(a) a vanadium trihalide of chlorine, bromine or iodine; and

(b) an electron donor which is a liquid, organic, Lewis base in which said vanadium trihalide is soluble, said electron donor being selected from the group consisting of aliphatic ketones, aliphatic amines, aliphatic alcohols, and alkyl and cycloalkyl ethers;

(2) a modifier having the formula:

$$MX_a$$

wherein:

M is either boron or $AlR_{(3-a)}$ and wherein each R is independently alkyl provided that the total number of aliphatic carbon atoms in any one R group may not exceed 14;

X is chlorine, bromine or iodine; and

a is 1 or 2 with the provision that when M is boron a is 3; and

(3) wherein said vanadium compound and said modifier are on a solid, inert carrier which consists essentially of silica or alumina.

4,508,843

SUPPORTED POLYOLEFIN CATALYST FOR THE POLYMERIZATION OF ETHYLENE UNDER HIGH TEMPERATURES

Bradley P. Etherton, and Anthony D. Hamer, both of Houston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 8, 1983, Ser. No. 520,935

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—115 **20 Claims**

1. A catalyst component for (co)polymerizing ethylene at temperatures greater than about 150° C. which is the product obtained by treating at least one dehydrated particulate support material having an average particle size diameter of from about 0.05 to about 20 micron with

(a) at least one dihydrocarbyl magnesium compound wherein the hydrocarbyl groups can be the same or different,

(b) optionally, a chlorinating agent,

(c) a transition metal compound of a Group IVb, Vb, or VIb metal of the Periodic Table, and as the last treatment step prior to optional step (e)

(d) ethyl aluminum dichloride, and

(e) optionally, prepolymerizing with an alpha-olefin containing 4 to 18 carbon atoms.

4,508,844

SUPPORTED POLYOLEFIN CATALYST FOR THE POLYMERIZATION OF ETHYLENE UNDER HIGH TEMPERATURES

Agapios K. Agapiou, Humble, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 4, 1983, Ser. No. 520,391

Int. Cl.³ C08F *4/64, 4/68*

U.S. Cl. 502—132 **20 Claims**

1. In a catalyst component produced by,

(a) co-comminuting a support base, and an organic electron donor to form a catalyst component support, said support base selected from the Group IIa and IIIa salts and the salts of the multivalent metals of the first transition series with the exception of copper, and

(b) co-comminuting said catalyst component support with a transition metal compound of a Group IVb–VIb metal, to provide a catalyst component precursor

the improvement comprising contacting said precursor with transition metal halide or oxyhalide of Group IVb–Vb, washing the contacted product with an inert hydrocarbon diluent and prepolymerizing the washed product with an alpha-olefin having from 4 to 12 carbon atoms in the presence of an organometallic compound of the Group IIa and IIIa metals, whereby an improved catalyst component is obtained for the (co)polymerization of ethylene under a pressure of from about 30 to about 3,000 bar at a temperature of from about 130° C. to 350° C.

2. The improved catalyst component of claim 1 wherein the support base is magnesium dichloride, the transition metal compound of step (b) is titanium tetrachloride, the precursor is contacted with transition metal halide or oxyhalide neat or in hydrocarbon solution in a weight percent of 5 to 100 based on the amount of catalyst precursor and the improved catalyst component comprises from about 5 to about 200 weight percent of prepolymer.

3. The improved catalyst component of claim 2 wherein the catalyst precursor component is contacted with transition metal halide or oxyhalide from about 0.5 to about 5 hours at a temperature of from 30° to 130° C.

4. The improved catalyst component of claim 3 wherein a Lewis acid is co-comminuted with the support base and the electron donor.

4,508,845

CATALYTIC PREPARATION OF HIGH MOLECULAR WEIGHT POLYSILOXANES

Adrien Dromard, Paris, and Claude Millet, Saint-Priest, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Division of Ser. No. 377,589, May 12, 1982, Pat. No. 4,426,508. This application May 31, 1983, Ser. No. 499,472

Claims priority, application France, May 12, 1981, 81 09571

Int. Cl.³ B01J *31/08, 31/10*

U.S. Cl. 502—159 **14 Claims**

1. A catalyst for the preparation of high molecular weight polysiloxanes by polymerization/rearrangement of polysiloxanes of lower molecular weight, comprising

a porous, inorganic mineral particulate support having an average pore diameter in excess of 20 Å and a pore volume ranging from 0.2 to 2 ml/g, said porous support being grafted with less than 15 mg/m² of a film of polymeric material comprising pendant sulfonic or phosphonic acid functions, and said polymeric material being characterized by an ion exchange capacity of less than 2 milliequivalents per gram.

4,508,846

RUTHENIUM CARBONYL CATALYST SUPPORTED ON CERIC OXIDE FOR PREPARATION OF OLEFINS FROM SYNTHESIS GAS

Ronald Pierantozzi, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 373,934, May 3, 1982, abandoned. This application Mar. 5, 1984, Ser. No. 573,525

Int. Cl.³ B01J *23/46, 27/20*

U.S. Cl. 502—174 **9 Claims**

1. A catalyst for the selective synthesis of olefins from mixtures of hydrogen and carbon monoxide comprising a ruthenium carbonyl compound deposited on a ceric oxide-containing support made by preparing a solution of the ruthenium carbonyl compound in a solvent sufficient to wet the entire surface of the ceric oxide-containing support, contacting the ceric oxide-containing support with the ruthenium carbonyl compound-containing solution and removing the solvent to yield the ruthenium carbonyl compound on the ceric oxide-containing support.

4,508,847

CARBON-CONTAINING MOLYBDENUM AND TUNGSTEN SULFIDE CATALYSTS

Russell R. Chianelli, Somerville, N.J., and Theresa A. Pecoraro, Danville, Calif., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 399,991, Jul. 20, 1982, abandoned. This application Nov. 16, 1983, Ser. No. 552,404

Int. Cl.³ B01J *27/24, 21/18, 27/02*

U.S. Cl. 502—200 **12 Claims**

1. A process for forming a carbon-containing, poorly crystalline metal sulfide catalyst which comprises contacting one or more catalyst precursor salts, in the presence of sulfur and hydrogen and at elevated temperature, with a hydrocarbon for a time sufficient to form said catalyst wherein said precursor salt has the formula $B_x[MO_ySs_{4-y}]$ wherein x is 1 or 2 and y is any value between 0 and 4, wherein M is Mo or W and wherein B is (a) an ammonium ion, or (b) an alkyl or aryl ion wherein said ion may contain from 1–4 alkyl or aryl groups.

4,508,848

CATALYSTS AND PROCESS OF MAKING

Serge R. Dolhyj, Parma, and Roseann M. Enyedy, Brecksville, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 11, 1983, Ser. No. 540,595
Int. Cl.[3] B01J *21/06, 21/00, 23/16*
U.S. Cl. 502—239 21 Claims

1. A composite complex oxide catalyst comprising (1) a particulate support containing Si or Al, or both, and Ti in the ratios represented by the empirical formula $TiSi_nAl_mO_x$, wherein n is a number from 0–5, m is a number from 0–6, n+m=0.4 to 6 and x is the number of oxygens required to satisfy the valence requirements of the other elements present; and (2) coated on the outer surface of said support a catalytic metal oxide composition containing vanadium and antimony wherein the atomic ratio of vanadium to antimony is in the range from 1:3 to 1:7 and the oxygen is present in the amount to satisfy the valence requirements of the other elements present in said coating, and

wherein the ratio of (2) to (1) is in the range from 1:50 to 3:7.

4,508,849

METHOD FOR PREPARATION OF CATALYST CARRIERS

Akira Inoue, Kawasaki; Shinji Takase; Yasuo Sekido, both of Yokohama; Masao Mori, Yokosuka, and Tatsuki Kubo, Kawasaki, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,136
Claims priority, application Japan, May 12, 1983, 58-81636
Int. Cl.[3] B01J *21/12, 21/04*
U.S. Cl. 502—263 6 Claims

1. Method for the preparation of alumina or silica-alumina catalyst carriers which comprises blending a precursor of alumina or silica-alumina carriers with polytetrafluoroethylene resin particles, warming the blend and subjecting the same to a compression and shearing operation in a blender, followed by drying and baking.

4,508,850

OLEFIN METATHESIS CATALYST

R. L. Banks, c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Division of Ser. No. 506,950, Jun. 22, 1983, Pat. No. 4,454,368. This application Feb. 13, 1984, Ser. No. 579,334
Int. Cl.[3] B01J *21/04, 21/06, 23/14*
U.S. Cl. 502—351 20 Claims

1. A composition suitable for the disproportionation of olefins comprising the product produced by contacting rhenium oxide and a support with a promoting amount of at least one aluminum alkyl compound and heating the aluminum alkyl treated rhenium oxide to a temperature of at least about 200° C. suitable for said aluminum alkyl to promote the activity of said rhenium oxide for the disproportionation reaction.

4,508,851

FIBROUS ACTIVATED CARBON AND PROCESS OF PRODUCING IT

Kazuo Izumi; Kenji Shimazaki, and Kenji Seki, all of Shizuoka, Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1983, Ser. No. 506,269
Claims priority, application Japan, Jun. 23, 1982, 57-107760
Int. Cl.[3] C01B *31/12*
U.S. Cl. 502—426 21 Claims

1. A process of producing fibrous activated carbon having a pH not greater than 5 by acid-treatment comprising (i) subjecting raw fibrous activated carbon fiber to an acid so as to attach or adsorb said acid to said fiber and (ii) if necessary, adjusting the pH of the fibrous activated carbon to not greater than 5, wherein the raw fibrous activated carbon has a specific surface area of at least 500 m^2/g after the acid-treatment.

10. The process as claimed in claim 1 wherein the fibrous activated carbon is derived from fibers selected from the group consisting of acrylonitrile-based fibers, pitch-based fibers, and phenol-based fibers.

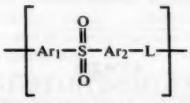
4,508,852

COMPOSITIONS AND METHOD OF PREPARATION BY CHLOROSULFONATION OF DIFFICULTLY SULFONATABLE POLY(ETHER SULFONE)

Benjamin Bikson, Brookline; Myron J. Coplan, Natick, and Gertrud Götz, Brookline, all of Mass., assignors to Albany International Corp., Albany, N.Y.

Filed Sep. 22, 1983, Ser. No. 534,799
Int. Cl.[3] C08G *65/48*
U.S. Cl. 521—27 8 Claims

1. A chlorosulfonated polyarylethersulfone resin which may be linear or branched and which comprises a plurality of repeating units of the formula:



wherein Ar_1 and Ar_2 each represent phenylene or phenylene partially substituted with non-deactivating groups and where Ar_1 and Ar_2 may be the same or different and wherein some of the phenylene moieties are also substituted with hydroxysulfonyl groups and some of the phenylene moieties are also substituted with chlorosulfonyl groups, the ratio of chlorosulfonyl groups to hydroxysulfonyl groups being within the range of from 0.01–20:1 while the combined contents of both hydroxysulfonyl and chlorosulfonyl groups in the above mentioned polymer range from about 0.05 to about 4 milliequivalents per gram of dry resin; L represents oxygen.

4,508,853

POLYURETHANE PREPOLYMERS BASED ON OLEOCHEMICAL POLYOLS

Hermann Kluth, Duesseldorf, and Alfred Meffert, Monheim, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed May 8, 1984, Ser. No. 608,322
Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317194
Int. Cl.[3] C08G *18/34*
U.S. Cl. 521—107 20 Claims

1. A starting material for polyurethane foam comprising: a polyurethane prepolymer containing terminal isocyanate groups comprising the reaction product of (1) a stoichiometric excess of an aromatic isocyanate containing an average of 2 to 4 isocyanate groups per molecule and (2) an oleochemical polyol obtained from the complete or partial ring opening of epoxidized triglycerides of a fatty acid mixture containing at least partly olefinically unsaturated fatty acids with a monohydric or polyhydric alcohol; and an effective amount of a blowing agent, said blowing agent being at least partially soluble in said polyurethane prepolymer.

4,508,854

QUATERNIZED CELLULAR POLYMERS FROM AMINE TERMINATED POLY(AMINOETHERS) AND POLYFUNCTIONAL EPOXIDES

Shmuel Dabi, Highland Park, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Apr. 27, 1984, Ser. No. 604,708
Int. Cl.[3] C08J *9/08*
U.S. Cl. 521—178 13 Claims

1. An absorbent cellular polymeric material comprising the

reaction product of a poly(amino ether) and an epoxy resin, said reaction product having quaternized amine groups.

4,508,855

DRY MIX FRICTION BEARING MATERIAL

Walter B. Peters, Englewood, Colo., assignor to Manville Service Corporation, Denver, Colo.

Filed Jul. 6, 1984, Ser. No. 628,172
Int. Cl.[3] C08L *61/10*; C08K *3/22*
U.S. Cl. 523—153 **6 Claims**

1. A friction material suitable for use as a bearing, comprising:

(a) 20–40 weight percent phenolic resin;

(b) 5–15 weight percent graphite;

(c) 0.5–3.5 weight percent carbon black;

(d) 40–60 weight percent of a non-asbestos refractory fiber comprising at least 25 wt.% CaO and 35 wt.% SiO_2; and

(e) 4–10 weight percent acrylic fiber.

4,508,856

COMPOSITES UTILIZING FILLERS OF SURFACE MODIFIED HOLLOW MICROSPHERES

Christopher G. Smith, Flourtown, and John F. Peters, Lansdale, both of Pa., assignors to PQ Corporation, Valley Forge, Pa.

Filed Oct. 28, 1983, Ser. No. 546,232
Int. Cl.[3] C08J *9/32*
U.S. Cl. 523—218 **4 Claims**

1. In the method of using water resistant non-fused microspheres as fillers for polymer systems wherein the microspheres are characterized by a weight percent ratio of "polysalt" solids to sodium silicate solids of 0.02:1 to 2.0:1, said sodium silicate containing 1.5 to 4.0 moles of SiO_2 per mole of Na_2O; a particle size of about 5 to 2000 microns; less than 7% (wt/wt) moisture and 0.1 to 5.0% (wt/wt) of a multivalent metal that decreases the solubility of the microsphere in water; the improvement comprising combining said microspheres having pH values between about 4 and 7 in water that have not been washed free of anions with an aqueous emulsion or suspension of a polymer that is not sensitive to high ionic concentrations and setting said polymer which now contains the microspheres.

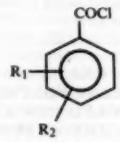
4,508,857

COLOR-STABILIZED AROYL CHLORIDE COMPOSITIONS

Richard H. Chow, Williamsville, and Emil J. Geering, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

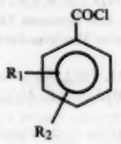
Filed Aug. 15, 1983, Ser. No. 523,238
Int. Cl.[3] C07C *51/64*
U.S. Cl. 260—544 D **7 Claims**

1. An aroyl chloride composition comprising an aroyl chloride of the formula



wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, halogen, alkyl and alkoxy containing about 0.00001 to about 5.0 percent by weight of methanamide.

5. A method for color-stabilizing an aroyl chloride of the formula



wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, halogen, alkyl, and alkoxy, which comprises adding thereto about 0.0001 to about 5.0 percent by weight of methanamide.

4,508,858

APPARATUS AND METHOD FOR PREPARING POLYMER SOLUTIONS

Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

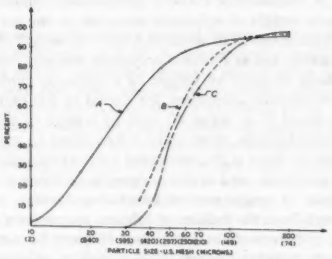
Filed Feb. 16, 1983, Ser. No. 466,737
Int. Cl.[3] C08L *33/26*
U.S. Cl. 523—313 **10 Claims**

1. A process for the continuous preparation of aqueous polymer solutions for use as drive fluids and/or mobility control buffers in the secondary or tertiary recovery of oil from subterranean oil-bearing formations, comprising: forming a first reaction mixture containing a polymerizable substance and a polymerization initiator; introducing said reaction mixture into a first reaction vessel having an inlet and an outlet; repeating at regular predetermined intervals the forming of additional reaction mixtures corresponding to said first reaction mixture and introducing each of said additional reaction mixtures successively into the first reaction vessel in a manner to substantially uniformly and evenly distribute each of said additional reaction mixtures across the internal cross-sectional area of said first reaction vessel to provide a plurality of individual layers therein, each of said layers sharing a substantially stable interface with the layer immediately preceding it and the layer immediately succeeding it and comprising a reaction mixture in which the extent of the polymerization reaction has reached a stage which differs from that of every other layer in the first reaction vessel; controlling the rate of movement of each reaction mixture layer in said reaction vessel from the inlet to the outlet thereof in a manner such that as each reaction mixture layer is continuously moved through the reaction vessel the polymerization of the polymerizable substance in each reaction mixture layer will be essentially completed when each of the reaction mixture layers successively reaches the outlet of the first reaction vessel; successively and continuously removing each of the layers from the outlet of the first reaction vessel; introducing a modifying agent capable of reacting with the polymer formed in the first reaction vessel into each of the layers as they are successively and continuously removed from said first reaction vessel to form each layer into a second reaction mixture; successively and continuously introducing each layer of said second reaction mixture into a second reaction vessel having an inlet and an outlet in a manner to substantially uniformly and evenly distribute each layer of said second reaction mixture across the internal cross-sectional area of said second reaction vessel to provide a plurality of individual zones of said second reaction mixture therein, each of said zones of the second reaction mixture being characterized in that the extent of the completeness of the reaction between the polymer and the modifying agent varies progressively from the inlet to the outlet of the second reaction mixture; successively and continuously removing each of the zones of the second reaction mixture from the outlet of the second reaction vessel; and diluting said second reaction mixture prior to injecting it into an input well of a subterranean oil-bearing formation.

4,508,859
FINISHING OF ROTATIONAL MOLDING GRADE RESIN

Mike E. Muhle, Kingwood; Richard J. Stolz, LaPorte, and Cecil W. Wright, Baytown, all of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 22, 1982, Ser. No. 452,269
Int. Cl.³ C08J 3/20
U.S. Cl. 523—346 15 Claims



1. A method of finishing polyolefin thermoplastic granules for rotomolding, which comprises:

(a) blending polyolefin thermoplastic granules and additive material at a temperature below the softening point of the thermoplastic to form a masterblend;

(b) introducing the masterblend and additional polyolefin thermoplastic granules into an intensive mixer in an additional resin/masterblend weight ratio between about 5:1 and 50:1, and mixing the same (i) until the temperature of the resin reaches its softening point but below its fluxing temperature whereby the additive material is incorporated into or onto substantially all of the granules (ii) until the particle size of the granules is reduced to the extent that at least about 80 weight percent of the granules are smaller than about 30 mesh, and (iii) until the bulk density of the granules is increased by at least 10%;

(c) withdrawing the granules from the intensive mixer and cooling the particles below the fusion temperature of the additive and below the softening point of the resin; and

(d) removing essentially all of the particles larger than 30 mesh.

4,508,860
DISCONTINUOUS FIBER PRETREATMENT

David H. Hawes, Mt. Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 352,229, Feb. 25, 1982, abandoned. This application Mar. 7, 1984, Ser. No. 587,047
Int. Cl.³ B32B 5/16
U.S. Cl. 524—13 7 Claims

1. In a method of incorporating unregenerated discontinuous cellulose fibers within a vulcanizable elastomeric matrix, a fiber pretreatment which consists essentially of mixing from 3% to 15% by weight vinyl pyridine latex with a fiber-in-water mixture of essentially delignified hardwood fibers which have not been subjected to post-delignification drying, said mixture having a consistency of from 10% to 40% solids, subsequently expressing water and drying the treated fiber.

4,508,861
THERMALLY STABILIZED POLYETHERIMIDES

Roger W. Avakian, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 29, 1983, Ser. No. 566,698
Int. Cl.³ C08K 5/53
U.S. Cl. 524—101 23 Claims

1. A thermally stabilized polyetherimide which comprises a polyetherimide and a stabilizing amount of antioxidant selected from the group comprising (a) a hindered phenol, (b) an arylphosphonite, (c) an organic phosphite, (d) a thioester, and (e) mixtures thereof, wherein said antioxidant has a molecular weight greater than 400.

4,508,862
PROCESS FOR THE PRODUCTION OF FLUID AQUEOUS DISPERSIONS OF POLYMERS OF CONJUGATED DIENES

Adolf Schmidt, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk

Filed Nov. 24, 1982, Ser. No. 444,157
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1981, 3148107
Int. Cl.³ C08K 5/42
U.S. Cl. 524—157 7 Claims

1. A process for the production of a fluid, aqueous dispersion of one or more conjugated diene homo- and/or copolymers, which dispersion has a viscosity of less than 50,000 mPas, measured at 1 bar and 22° C., a solids content of from 25 to 55%, by weight, and an average particle diameter of from 20 to 150 nm, which comprises:

adding to a non-fluid, alkane polysulfonate salt-free, aqueous dispersion of one or more conjugated diene homo- and/or copolymers, which non-fluid, alkane polysulfonate salt-free, aqueous dispersion has a viscosity of more than 50,000 mPas, as measured at 1 bar and 22° C., a solid content of from 22 to 55%, by weight, and an average particle diameter of from 20 to 150 nm,

one or more water soluble salts of one or more alkane polysulfonates in an amount of 0.05 to 0.5%, by weight, based on the solids content of the non-fluid, alkane polysulfonate and in the form of a dilute aqueous solution.

4,508,863
STABILIZATION OF POLYVINYL CHLORIDE

Otto S. Kauder, New York, and Charles Keeley, Wantagh, both of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Continuation of Ser. No. 511,432, Jul. 6, 1983, abandoned. This application Feb. 10, 1984, Ser. No. 578,936
Int. Cl.³ C08K 5/57, 5/09, 9/04
U.S. Cl. 524—181 17 Claims

13. A polyvinyl chloride resin composition having an enhanced resistance to deterioration when heated and worked, comprising a polyvinyl chloride resin, a polyvinyl chloride resin stabilizer, and a highly branched alpha-olfin oligomer obtained by oligomerization of a 1-olefin having from about six to about twelve carbon atoms, and having alkyl branches of at least two carbon atoms, the alpha-olefin oligomer being in an amount to enhance the stabilizing effect of the polyvinyl chloride resin stabilizer.

4,508,864
PRESSURE SENSITIVE ADHESIVES

Ivan S. Lee, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Continuation of Ser. No. 357,093, Mar. 11, 1982,. This application Oct. 7, 1983, Ser. No. 539,636
Claims priority, application Canada, Apr. 28, 1981, 376453
Int. Cl.³ C08L 9/08, 93/00
U.S. Cl. 524—187 9 Claims

1. A composition comprising a latex of a polymer and a tackifier resin wherein said polymer is formed by polymerizing:

(a) from about 20 to about 45 weight percent of a vinyl or vinylidene monoaromatic monomer which is unsubstituted or substituted in the aromatic ring by a C_{1-4} alkyl radical or a bromine or chlorine atom;

(b) from about 50 to about 75 weight percent of a C_{4-6} conjugated diene monomer; and

(c) from about 1 to about 5 weight percent of an unsaturated carboxylic acid monomer; and wherein said polymer has:

(i) a weight average molecular weight distribution so that from about 20 to about 45 weight percent of the polymer has a molecular weight from about 3,500 to about 36,000;

(ii) a polymeric Tg (DSC) from about −29.5° to about −62° C.; and

(iii) a toluene insoluble portion from about 20 percent to about 70 percent by weight; and wherein said tackifier resin comprises from about 10 to about 35 parts by weight per 100 parts by weight of said polymer and is selected from the group:

(a) a rosin or a hydrogenated rosin ester which has a ring and ball softening temperature from about 75° to about 100° C.

4,508,865

S-(4-HYDROXYPHENYL)THIOCARBOXYLIC ESTER ANTIOXIDANTS

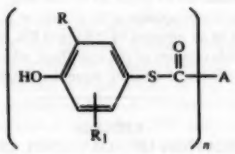
John D. Spivack, and Stephen D. Pastor, both of Spring Valley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,561

Int. Cl.³ C08K *5/36;* **C07C** *153/09*

U.S. Cl. 524—283 **11 Claims**

1. A compound of the formula



wherein

R and R_1 are in the ortho position to the hydroxyl group and are independently hydrogen, alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 12 carbon atoms;

n=2, and A is alkylene of from 1 to 10 carbon atoms, cycloalkylene of 5 to 6 carbon atoms arylene, biphenylene or hydroxy-substituted arylene.

8. A composition of matter comprising an organic material subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound of claim **1**.

4,508,866

POLYMERIC ANTITUMOR AGENT

Edward H. Mottus, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 274,596, Jun. 17, 1981, abandoned. This application Oct. 7, 1983, Ser. No. 540,215

Int. Cl.³ C08K *3/16;* **C08F** *222/06*

U.S. Cl. 524—401 **9 Claims**

1. An antitumor active, water-soluble composition of matter selected from the group consisting of low molecular weight copolymers of butyl vinyl ether and maleic anhydride, wherein said molecular weight is less than about 3000 and wherein said copolymer is derivatized to contain half-amide, half-carboxyl acid groups in which from 0 weight percent to about 25 weight percent of the half amide, half-carboxyl acid groups are converted to imide groups, and the pharmaceutically acceptable cationic salt derivatives of said derivatized copolymers.

4,508,867

POLYMER COMPOSITIONS COMPRISING POLYAMIDES, CARBOXYLATED (METH)ACRYLONITRILE-BUTADIENE RUBBER, AND NONPOLYMERIC ADDITIVES

Kyosaku Sato, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Nov. 7, 1983, Ser. No. 549,502

Int. Cl.³ C08K *3/16, 3/10, 3/20*

U.S. Cl. 524—434 **16 Claims**

1. A vulcanizable rubbery composition comprising, per 100 parts by weight of polymeric materials, as one polymeric material from about 10 to about 32.5 parts by weight of a crystalline polyamide and as a second polymeric material from about 67.5 to about 90 parts by weight of a synthetic rubbery polymer which polymer comprises, for a total of 100 parts by weight, from about 25 to about 40 parts by weight of acrylonitrile or methacrylonitrile, from about 0.5 to about 10 parts by weight of one or more α,β-unsaturated carboxylic acid and the balance butadiene, and as non-polymeric additives from about 0.1 to about 15 weight percent based on polyamide of an additive selected from the halides of lithium, magnesium, calcium and zinc, and from about 1 to about 10 parts by weight per 100 parts by weight of polymeric materials of an additive selected from the oxides and hydroxides of magnesium, calcium, barium and zinc and the peroxides of calcium and zinc and further comprising sulphur vulcanization active agents.

4,508,868

POLYMERIC FAT ACID POLYAMIDE RESINS FOR USE IN FLEXOGRAPHIC INK VEHICLES HAVING REDUCED SOLVENT EMISSIONS

Paul D. Whyzmuzis, Plymouth, and Anne E. Spinks, Minneapolis, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Mar. 29, 1984, Ser. No. 594,514

Int. Cl.³ C08G *69/34*

U.S. Cl. 524—607 **14 Claims**

1. A polyamide comprising the condensation product of (A) an amine component comprising from 50–60 equivalent percent of a short chain diamine having from 2–3 carbon atoms and 40–50 equivalent percent of a long chain diamine having 6–10 carbon atoms and (B) an acid component comprising from 45–55 equivalent present of a polymerized fatty acid having a dimeric fat acid content between 65–75% by weight, 15–30 equivalent percent of an unsaturated monobasic fatty acid having from 12–22 carbon atoms and the remainder of the acid component being a lower aliphatic monobasic acid of the formula RCOOH where R is hydrogen or an aliphatic hydrocarbon radical of 1–4 carbon atoms, the equivalents ratio of acid equivalents from said acid component to amine equivalents from said amine component being in the range of about 1.04–1.09.

4,508,869

LATEXES OF POLYMERS HAVING PENDANT COREACTIVE AND OXAZOLINE GROUPS

William H. Keskey; James E. Schuetz, and Do I. Lee, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

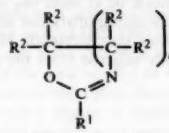
Filed Jun. 14, 1983, Ser. No. 504,120

Int. Cl.³ C08L *39/00*

U.S. Cl. 524—808 **13 Claims**

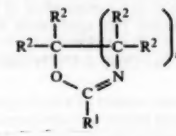
1. A curing latex composition comprising discrete polymer particles, which particles contain pendant coreactive groups selected from the group consisting of weak acid groups, aliphatic alcohols, aromatic alcohols, amines and amides and pendant oxazoline groups, which particles have been prepared by the polymerization of addition polymerizable monomers, which monomers comprise (a) a coreactive monomer containing pendant groups which are capable of reacting with an

oxazoline group to form a covalent bond thereto, (b) an oxazoline as represented by the general structure:



wherein R^1 is an acyclic organic radical having addition polymerizable unsaturation; each R^2 is independently hydrogen, halogen or an inertly substituted orgaanic radical and n is 1 or 2 and (c) at least one other addition polymerizable monomer which does not contain a coreactive or oxazoline group.

8. A process for preparing a latex comprising discrete particles containing pendant weak acid and oxazoline groups, said process comprising the steps of (a) forming a latex containing particles of a polymer containing pendant weak acid groups by polymerizing a first monomer mix comprising an addition polymerizable monomer containing pendant weak acid groups and at least one other addition polymerizable monomer which is copolymerizable with said monomer, said polymerization being conducted at a pH in the range from about 1 to about 6, then (b) adjusting the pH of the resulting latex to a value at which an addition polymerizable oxazoline does not substantially react or hydrolyze under conditions suitable for the polymerization thereof, (c) adding to said latex a second monomer mix comprising (1) an addition polymerizable oxazoline as represented by the general formula:



wherein R^1 is an acyclic organic radical hving addition polymerizable unsaturation; each R^2 is independently hydrogen, halogen or an organic radical and n is 1 or 2 and (2) at least one other monomer and (d) polymerizing said monomer mix under conditions such that the second monomer mix is polymerized within or around said polymer particles containing pendant weak acid groups.

4,508,870
POLYBLENDS OF THERMOPLASTIC COPOLYETHERESTERS AND ACRYLONITRILE-BUTADIENE-STYRENE POLYMERS

Daniel L. Dufour, Waterloo, Belgium, and William J. Jones, Holyoke, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 27, 1984, Ser. No. 574,445
Int. Cl.³ C08L *55/02*
U.S. Cl. 525—64 **10 Claims**

1. A polyblend comprising:

A. from 1 to 15% by weight of a thermoplastic copolyetherester elastomer with the provision that if the thermoplastic copolyetherester elastomer contains less than 40% by weight soft segments, the amount of the thermoplastic copolyetherester elastomer is in the range of from 1 to 10% by weight; and

B. from 99 to 85% by weight of a grafted polymer composition comprising a graft polymer of from 20 to 40 parts by weight of a monomer selected from the group consisting of methyl methacrylate and acrylonitrile and 80 to 60 parts by weight of a vinyl aromatic monomer, the polymer being grafted onto a substrate rubber having a glass transition temperature below 0° C. wherein the monomers are polymerized in the presence of and grafted onto the substrate rubber, wherein the weight percent of the rubber is in the range from 1 to 60% by weight based on the weight of the composition;

and wherein the weight percent for Components (A) and (B) are based on the total amount of Components (A) and (B) in the polyblend.

4,508,871
TRANSPARENT BLENDS OF POLYMETHYLMETHACRYLATE AND CERTAIN STYRENE COPOLYMERS

Henno Keskkula, Austin, Tex.; Kathleen M. McCreedy, and Donald A. Maass, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 255,957, Apr. 20, 1981, abandoned. This application Feb. 28, 1983, Ser. No. 470,419
Int. Cl.³ C08L *33/10, 51/00*
U.S. Cl. 525—78 **14 Claims**

1. Polyblended, organic thermoplastic polymers composition, transparent in visual perception by the unaided human eye,

said composition being particularly characterizable in having a light absorbance value in the 640 nanometer wave length that is not greater than about 0.12 by standard test when said composition in a solid, shaped specimen form that has an at least substantially uniform thickness which at least approximates 10 mils is disposed and exposed perpendicularly to the path of a ray of said 640 nanometer wavelength light from a source thereof,

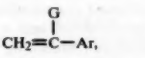
said composition comprising, in intimate, thoroughly physically interdispersed admixture:

(a) polymethylmethacrylate in an effective, substantial quantity as an indispensable essential component in said polyblended composition; plus

as additional polyblended component(s) in admixture with said polymethylmethacrylate component (a), a polymeric complement of:

(b) from 1 to about 99 weight percent, based on total composition weight of a copolymerizate of an alkenyl aromatic monomer and a monomeric vinyl acid containing polymerized in the copolymer molecule between about 95 and about 50 weight percent of the alkenyl aromatic monomer,

said alkenyl aromatic monomer being of the Formula:



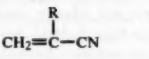
(I)

wherein G is selected from the Group consisting of hydrogen and methyl and Ar is an aromatic radical including alkyl and halo-ring-substituted aromatic units of from 6 to about 10 carbon atoms,

said vinyl acid monomer being selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid and mixtures thereof; and

(c) from 0 to 70 weight percent of a mass-made acrylonitrile-butadiene-styrene-type resin that comprises:

from about 14 to about 28 parts by weight of a cyanoalkene of the Formula:



(III)

wherein R is selected from the Group consisting of hydrogen and a lower alkyl unit containing not more than about 4 carbon atoms therein;

from about 86 to about 72 parts by weight of an alkenyl aromatic monomer of the Formula (I); and

between about 5 and about 18 weight percent of a natural or synthetic rubber ingredient, said rubber ingredient being

in the form of particles having a weight average diameter range of from about 0.3 micron to about 5 microns having occluded styrene-acrylonitrile polymer therein;

with the formulation limitations attendant said polyblend composition that:

(i) when there is no quantity of component (c) in the polyblended composition, the weight percent of said component (b) therein present is at least about 1; and

(ii) when both said component (b) and component (c) are present in the polyblended composition, the weight percent of said component (b) therein present is at least about 1 and the weight percent of said component (c) therein present is at least about 20.

4,508,872

HIGH TOUGHNESS PROPYLENE POLYMER COMPOSITIONS

J. Douglas McCullough, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 22, 1984, Ser. No. 582,417

Int. Cl.³ C08L *53/00, 23/04, 23/26*

U.S. Cl. 525—88 **28 Claims**

1. A composition having a melt flow between about 5 and about 50 dg/min (ASTM D1238—Condition L), and a high notched impact value, said composition being obtained by first peroxide-contacting an impact-improved propylene-ethylene copolymer and then melt mixing the resulting visbroken propylene polymer with a linear low density ethylene copolymer and a high density ethylene homopolymer, wherein

(a) said impact-improved propylene-ethylene polymer has a melt flow (ASTM D1238-Condition L) of about 0.5–15 dg/min and an elastomeric propylene-ethylene copolymer content of 5–50% by weight, the copolymer fraction having an ethylene content of 30–95% by weight, which propylene-ethylene polymer is the product of sequential polymerization of propylene and a propylene-ethylene mixture over a titanium halide-containing coordination catalyst;

(b) said high density ethylene homopolymer has a density in the range from 0.941 to 0.965 grams per cubic centimeter and a melt index (ASTM D1238-Condition E) in the range from 0 to 20 dg/min;

(c) said linear low density ethylene copolymer is the product of random polymerization of ethylene with up to 15 mole percent of at least one C_3–C_8 alpha olefin monomer over a transition metal-based coordination catalyst and which has a density below 0.935 and a melt index (ASTM D1238-Condition E) not exceeding 16; and

(d) said composition comprises 50–90% by weight of said impact-modified propylene polymer, 3–45% by weight of said high density ethylene homopolymer, 3–45% by weight of said linear low density ethylene copolymer, wherein the weight ratio of said high density ethylene homopolymer to said linear low density ethylene copolymer is between 80:20 and 20:80.

4,508,873

EMULSIONS OF LIQUID HYDROCARBONS WITH WATER AND/OR ALCOHOLS

Russell R. Reeves, Richmond, Australia, assignor to Apace Research Limited, New South Wales, Australia

Division of Ser. No. 471,536, Mar. 2, 1983, Pat. No. 4,482,666. This application Mar. 8, 1984, Ser. No. 587,631

Claims priority, application Australia, Mar. 12, 1982, PF3086/82; Nov. 30, 1982, PF7052/82

Int. Cl.³ C08L *9/00*

U.S. Cl. 525—91 **26 Claims**

1. An emulsifying preparation for use in the formation of emulsions containing a hydrocarbon liquid in one phase and water and/or an alcohol in the other phase,

said emulsifying preparation comprising a solution consisting essentially of an emulsifier and a coupling agent in a suitable solvent, said emulsifier and said coupling agent being present in said solution in a weight ratio of 1:3 to 3:1,

said emulsifier being a block copolymer containing at least one polymeric block of at least one monomer selected from the group consisting of styrene and ring substituted styrenes and at least one polymeric block containing at least one monomer selected from the group having the formula:

$$H(O—R)_nOH$$

wherein

R is an aliphatic hydrocarbon radical containing from 1 to 4 carbon atoms, and

n is a number between 4 and 4000,

said coupling agent being soluble in the continuous phase of said emulsion and being substantially insoluble in the discontinuous phase of said emulsion, said coupling agent being such that it will couple with that part of said emulsifier which is solvated by the continuous of said emulsion.

4,508,874

IMPACT RESISTANT POLYMERIC COMPOSITIONS CONTAINING POLYAMIDES, MALEIC ANHYDRIDE ADDUCTS OF HYDROGENATED POLYMERS AND GRAFT COPOLYMERS THEREOF

William L. Hergenrother, Akron, Ohio; Mark G. Matlock, Decatur, Ill., and Richard J. Ambrose, Erie, Pa., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 410,094, Aug. 20, 1982, Pat. No. 4,427,828, which is a continuation-in-part of Ser. No. 298,424, Sep. 1, 1981, abandoned, which is a continuation of Ser. No. 115,635, Jan. 28, 1980, abandoned, which is a continuation of Ser. No. 31,577, Apr. 19, 1979, abandoned. This application Nov. 4, 1983, Ser. No. 548,904

Int. Cl.³ C08F *8/00, 297/04*

U.S. Cl. 525—285 **9 Claims**

1. A maleic anhydride adduct of a hydrogenated polymer of one or more conjugated dienes or hydrogenated copolymer of a conjugated diene and a vinyl aromatic hydrocarbon, said hydrogenated polymer or copolymer having a residual unsaturation content of from about 0.5 to about 20% of its original unsaturation content prior to hydrogenation.

4,508,875

MULTI-LAYER STRUCTURE POLYMER COMPOSITION

Kazuo Kishida, Ohtake; Akira Hasegawa, Hiroshima, and Masahiro Sugimori, Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 349,910, Feb. 18, 1982, abandoned. This application Aug. 26, 1983, Ser. No. 526,546

Claims priority, application Japan, Feb. 25, 1981, 56-26553; Mar. 9, 1981, 56-33653

Int. Cl.³ C08F *265/06*

U.S. Cl. 525—308 **20 Claims**

1. A multi-layer structure polymer composition having the following layers as fundamental structural units;

(a) an innermost layer polymer (A) comprising 50–100 parts by weight of an alkyl acrylate having a C_1–C_8 alkyl group (A_1), 0–50 parts by weight of an alkyl methacrylate having a C_1–C_4 alkyl group (A_2), provided that the total of (A_1) and (A_2) is 80–100 parts by weight, 0–20 parts by weight of a monomer having a copolymerizable double bond (A_3), 0–10 parts by weight of a polyfunctional monomer (A_4), provided that the total of (A_1), (A_2), (A_3) and (A_4) is 100 parts by weight, and 0.1–5 parts by weight, per 100 parts by weight of the total of (A_1) to (A_4), of a graft linking agent (A_5) and having a glass transition temperature of lower than 10° C., and a degree of swelling of from 2–10;

(b) a crosslinked elastic polymer (B) comprising 80–100 parts by weight of an alkyl acrylate having a C_1–C_8 alkyl group

(B_1), 0–20 parts by weight of an alkyl methacrylate having a C_1–C_4 alkyl group (B_2), 0–20 parts by weight of a monomer having a copolymerizable double bond (B_3), 0–10 parts by weight of a polyfunctional monomer (B_4), provided that the total of (B_1), (B_2) and (B_3) and (B_4) is 100 parts by weight, and 0.1–5 parts by weight, per 100 parts by weight of the total of (B_1) to (B_4), of a graft linking agent (B_5) and having a glass transition temperature of 0° C. or lower and a degree of swelling of from 3–15, with the proviso that the degree of swelling of layer B is higher than that of said innermost layer polymer (A);

(c) an outermost layer polymer (C) comprising 51–100 parts by weight of an alkyl methacrylate having a C_1–C_4 alkyl group (C_2), 0–29 parts by weight of an alkyl acrylate having a C_1–C_8 alkyl group (C_1) and 0–20 parts by weight of a monomer having a copolymerizable double bond (C_3), provided that the total of (C_1), (C_2) and (C_3) is 100 parts by weight, and having a glass transition temperature of 60° C. or higher; and

(d) at least one intermediate layer (D) between said polymer (B) layer and said polymer (C) layer comprising 10–90 parts by weight of an alkyl acrylate having a C_1–C_8 alkyl group (D_1), 90–10 parts by weight of an alkyl methacrylate having a C_1–C_4 alkyl group (D_2), 0–20 parts by weight of a monomer having a copolymerizable double bond (D_3), 0–10 parts by weight of a polyfunctional monomer (D_4), provided that the total of (D_1), (D_2), (D_3) and (D_4) is 100 parts by weight, and 0.15 parts by weight, based on a total of (D_1) to (D_4), of a graft linking agent (D_5), wherein the amount of alkyl acrylate in said intermediate layer (D) linearly decreases from the crosslinked elastic polymer (B) to the outermost layer polymer (C), and wherein the gel content of said multi-layer structural polymer composition is at least 50%.

4,508,876

GRAFT COPOLYMER USEFUL AS REINFORCEMENTS FOR VINYL CHLORIDE POLYMERS AND PROCESS FOR PREPARING THE SAME

Akira Takaki, and Hideki Hosoi, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 7, 1983, Ser. No. 511,479

Claims priority, application Japan, Jul. 13, 1982, 57-122445; Jun. 1, 1983, 58-98200

Int. Cl.³ C08F *279/06, 279/00*

U.S. Cl. 525—310 **4 Claims**

1. A graft copolymer comprising an aromatic vinyl monomer and an alkyl methacrylate grafted onto a butadiene copolymer, said graft copolymer being prepared by emulsion-polymerizing 20 to 60 parts by weight of a monomer mixture of 20 to 80% by weight of an aromatic vinyl monomer, 80 to 20% by weight of an alkyl methacrylate and 0 to 20% by weight of other vinyl monomer copolymerizable therewith in the presence of an aqueous latex of 80 to 40 parts by weight of a butadiene copolymer prepared from a monomeric mixture containing 5 to 35% by weight of styrene, 95 to 65% by weight of butadiene and 0 to 20% by weight of at least one other vinyl monomer copolymerizable therewith, said butadiene copolymer being a multistage polymer which is produced in at least two stages, in the last stage of which 20% by weight of the entire multistage butadiene copolymer is produced and the product of which has a butadiene content that is from 80% to 100% by weight and that is at least 5% by weight higher than the butadiene content of the entire multistage butadiene copolymer.

4,508,877

PROCESS FOR PRODUCING A HIGH PURITY CYCLIZED POLYMER OF ISOPRENE

Masaaki Todoko, and Hiroyuki Watanabe, both of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Nov. 22, 1983, Ser. No. 554,299

Claims priority, application Japan, Nov. 26, 1982, 57-206049

Int. Cl.³ C08F *8/48*

U.S. Cl. 525—333.1 **11 Claims**

1. A process for producing a cyclized polymer of isoprene having a dispersion degree not greater than 2 as defined by the ratio of $\overline{Mw}/\overline{Mn}$, where $\overline{Mw}$ is the weight-average molecular weight and $\overline{Mn}$ is the number-average molecular weight, comprising:

(a) polymerizing isoprene monomer in the presence of an organometallic compound expressed by the general formula RM, wherein R is an alkyl, aryl or aralkyl group and M is lithium, sodium or potassium; and

(b) placing the thus obtained polymer in contact with a catalyst comprising a boron trifluoride diethyl-ether complex and a carboxylic acid of the general formula $Cl_{3-n}H_nCCOOH$, wherein n is an integer ranging from 0 to 3 to obtain the cyclized polymer.

4,508,878

PROCESS FOR PRODUCING A BLOW MOLDING RESIN

Yoshiho Matsuo; Atsuhiko Yoshino, and Ryoji Nishijima, all of Ichihara, Japan, assignors to Nissan Chemical Industries Ltd and Nissan Maruzen Polyethylene Company, both of Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,248

Claims priority, application Japan, Jul. 14, 1983, 58-128523

Int. Cl.³ C08F *236/00*

U.S. Cl. 525—333.8 **3 Claims**

1. A process for producing a blow molding resin which comprises pelletizing a high density polyethylene prepared by means of a highly active Ziegler catalyst, wherein a cross-linking agent is added to the high density polyethylene in an amount such that the concentration of the cross-linking agent is from 0.001 to 0.01 phr relative to the high density polyethylene, and the pelletizing is conducted in an atmosphere having an oxygen concentration within the range of from 0.5 to 10% by volume.

4,508,879

CROSSLINKABLE COMPOSITION OF MATTER III

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 14, 1983, Ser. No. 458,119

Int. Cl.³ C08F *280/00*; C08L *63/00*

U.S. Cl. 525—528 **30 Claims**

1. A crosslinkable composition of matter, which composition comprises:

A. substantially gel-free dieneophile-functionalized epoxy-amine adduct, comprising the reaction product of (i) polyhydroxy functional epoxy-amine reactant comprising the reaction product of polyepoxy reactant having an average of at least about 2 epoxy groups per molecule with secondary amine reactant having a total of less than about 20 carbons per amino nitrogen, wherein each hydroxy group, if any, of the secondary amine is removed at least 1 carbon from each amino nitrogen, with (ii) dieneophile functional mono-isocyanate reactant; and

B. substantially gel-free, substantially isocyanate-free diene-functionalized polyisocyanate oligomer having number average diene functionality of at least about three, comprising the reaction product of (i) polyisocyanate reactant with (ii) isocyanate-reactive diene functional reactant, wherein the polyisocyanate reactant and the diene functional reactant are in molar equivalent ratio of one to at least about one, respectively.

4,508,880

"LIVING" POLYMERS AND PROCESS FOR THEIR PREPARATION

Owen W. Webster, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

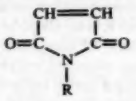
Continuation-in-part of Ser. No. 389,110, Jun. 17, 1982, Pat. No. 4,417,034, which is a continuation-in-part of Ser. No. 279,025, Jun. 30, 1981, abandoned. This application Nov. 7, 1983, Ser. No. 549,409

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.[3] C08F 4/58, 4/72, 2/00

U.S. Cl. 526—190 97 Claims

1. In a process comprising polymerizing the monomer selected from the group consisting of CH_2=C(Y)X,



and mixtures thereof wherein:

X is —CN, —CH=CHC(O)X′ or —C(O)X′;

Y is —H, —CH_3, —CN or —CO_2R, provided, however, when X is CH=CHC(O)X′, Y is —H or —CH_3;

X′ is —OSi(R^1)$_3$, —R, —OR or —NR′R″;

each R^1, independently, is hydrocarbyl of up to 20 carbon atoms;

R is hydrocarbyl of up to 20 carbon atoms, optionally containing one or more ether oxygen atoms within aliphatic segments thereof, and optionally containing one or more functional substituents that are unreactive under polymerizing conditions; and

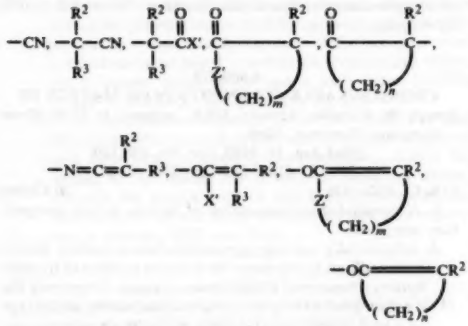
each of R′ and R″ is independently selected from C_{1-4} alkyl

by contacting the one or more monomers under polymerizing conditions with:

(i) the initiator of the formula (R^1)$_3$MZ wherein:

R^1 is as defined above;

Z is an activating substituent selected from the group consisting of



and mixtures thereof

X′ is as defined above for the monomer;

each of R^2 and R^3 is independently selected from H and hydrocarbyl of up to 20 carbon atoms, optionally containing one or more ether oxygen atoms within aliphatic segments thereof, and optionally containing one or more functional substituents that are unreactive under polymerizing conditions; and

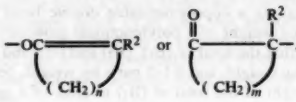
Z′ is O or NR′;

m is 2, 3 or 4;

n is 3, 4 or 5; and

M is Si, Sn, or Ge,

provided, however when Z is



M is Sn or Ge; and

(ii) a co-catalyst which is a source of fluoride, cyanide or azide ions or a suitable Lewis acid,

to produce "living" polymer having repeat units of the one or more monomers,

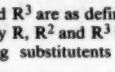
said process further characterized in that:

(a) R^1 is H, provided that at least one R^1 group is not H; and/or

(b) R is a polymeric radical containing at least 20 carbon atoms and optionally containing one or more ether oxygen atoms within aliphatic segments thereof and optionally containing one or more functional substituents that are unreactive under polymerizing conditions; and/or

(c) at least one of any R group in the monomer contains one or more reactive substituents of the formula —Z′(O)-C—C(Y^1)=CH_2 wherein Y^1 is H or CH_3 and Z′ is as defined above; and/or

(d) the initiator is of the formula (R^1)$_2$M(Z^1)$_2$ or O[M(R^1)$_2$$Z^1$]$_2$ wherein R^1 and M are as defined above and Z^1 is

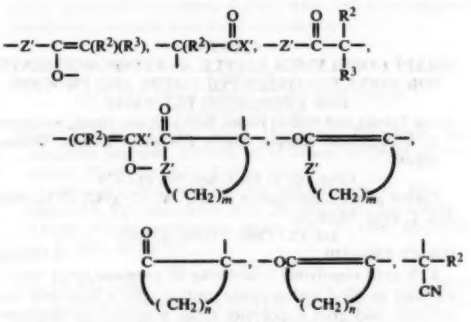


wherein X′, R^2 and R^3 are as defined above; and/or

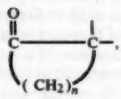
(e) at least one of any R, R^2 and R^3 in the initiator contains one or more initiating substitutents of the formula —Z^2—M(R^1)$_3$ wherein

M and R^1 are as defined above; and

Z^2 is a diradical selected from the group consisting of



and mixtures thereof, wherein R^2, R^3, X′, Z′, m and n are as defined above, provided, however, when Z^2 is

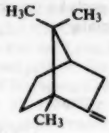


M is Sn or Ge; and/or

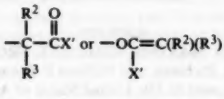
(f) Z is selected from the group consisting of —SR, —OP(NR′R″)$_2$, —OP(OR^1)$_2$, —OP[OSi(R^1)$_3$]$_2$ and mixtures thereof,

wherein R, R^1, R′ and R″ are as defined above; and/or

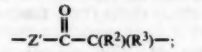
(g) R^2 and R^3 taken together are



provided, however, Z is



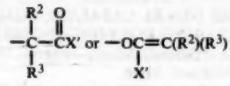
and/or Z^2 is



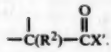
and/or

(h) X' and either R^2 or R^3 taken together are

provided, however, Z is



and/or Z^2 is



4,508,881

PROCESS FOR NONAQUEOUS DISPERSION POLYMERIZATION OF BUTADIENE IN THE PRESENCE OF POLYMERIC DISPERSING AGENTS

Morford C. Throckmorton, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 420,065, Sep. 20, 1982, Pat. No. 4,452,960. This application May 21, 1984, Ser. No. 612,225

Int. Cl.³ C08F *2/14*

U.S. Cl. 526—201 **19 Claims**

1. A process for the nonaqueous dispersion polymerization of butadiene monomer in a reaction mixture containing a liquid nonaqueous dispersion medium, the improvement which comprises carrying out the polymerization of the butadiene monomer in the presence of random copolymers of butadiene and isoprene to produce very high cis-1,4-polybutadiene.

4,508,882

BENZOTRIAZOLE COMPOUND AND HOMOPOLYMER OR COPOLYMERS THEREOF

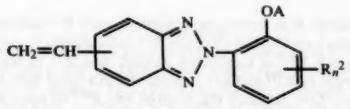
Shohei Yoshida, Yokohama, Japan, and Otto Vogl, Amherst, Mass., assignors to Asahi Glass Company Ltd., Tokyo, Japan

Division of Ser. No. 295,545, Aug. 24, 1981, Pat. No. 4,380,643, and a continuation-in-part of Ser. No. 238,090, Feb. 25, 1981, abandoned. This application Jan. 11, 1983, Ser. No. 457,221

Int. Cl.³ C08F *26/06*

U.S. Cl. 526—259 **2 Claims**

1. A homopolymer or copolymer with a vinyl comonomer of a benzotriazole compound having the formula:



wherein A is hydrogen or acetyl; R^2 is C_{1-4} alkyl; and n is 1 or 2 and when n is 2, said R^2 radicals may be the same or different.

4,508,883

ALTERNATING COPOLYMER OF BROMINATED STYRENE AND N-BROMINATED PHENYL MALEIMIDE

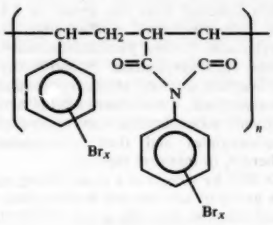
Usama E. Younes, Newtown Square, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 28, 1983, Ser. No. 489,688

Int. Cl.³ C08F *214/16*

U.S. Cl. 526—262 **1 Claim**

1. An alternating copolymer having the following general formula:



wherein each x separately represents an integer of from 1 to 5 and n represents an integer of from 10 to 2000.

4,508,884

OXYGEN PERMEABLE HARD CONTACT LENS

Joseph W. Wittmann, Rochester, and John M. Evans, Greece, both of N.Y., assignors to CooperVision, Inc., Scottsville, N.Y.

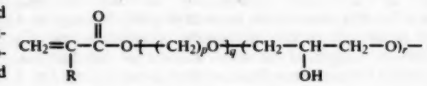
Filed May 25, 1983, Ser. No. 497,929

Int. Cl.³ C08F *30/08*

U.S. Cl. 526—279 **20 Claims**

1. A hard oxygen permeable contact lens of concavo-convex shape with the concave surface substantially conforming to the cornea of the eye, fabricated from a material formed by the copolymerization of

(a) about 9 to 90% by weight of a polymerizable ethylenically unsaturated silicone ester having the following formula:



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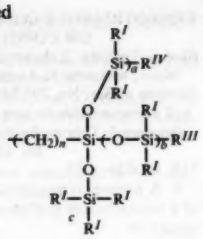


wherein R is hydrogen or methyl; each R^I individually is methyl or O—SiR_3^{II}; each R^{II} individually is methyl or phenyl; R^{III} is methyl or phenyl, and R^{IV} is methyl or phenyl or R^{III} and R^{IV} together form a bond with a bridging —O— between the Si atom and R^{III} to form a cyclic ring; each a, b, to form a cyclic ring; each a, b, and c individually is an integer of 0–3; p is an integer of 2–4; q is an integer of 0–10; n is an integer of 1–3; and r is an integer of 0–1;

(b) about 5 to about 90% by weight of a polymerizable ethylenically unsaturated ester selected from the group of isobornyl methacrylate, isobornyl acrylate, isobornyl crotonate, dicyclopentadienyl methacrylate, dicyclopentadienyl acrylate, dicyclopentadienyl crotonate, isopinocamphyl methacrylate, isopinocamphyl acrylate, isopinocamphyl crotonate, t-butylcyclohexyl methacrylate, 5-butylcyclohexyl crotonate, 3,3,5-trimethylcyclohexyl methacrylate, 3,3,5-trimethylcyclohexyl acrylate, 3,3,5-trimethylcyclohexyl crotonate, neopentyl methacrylate, neopentyl acrylate, neopentyl crotonate, or mixtures thereof;

(c) about 1 to 30% by weight of a hydrophilic monomer for wettability selected from the group of 2-hydroxyethyl acrylate, 2-hydroxyethyl methacrylate, acrylic acid, methacrylic acid, N-vinyl pyrrolidone, maleic anhydride, acrylamide, methacrylamide, N,N-dimethylacrylamide, glyceryl acrylate, glyceryl methacrylate, dimethylaminoethyl methacrylate, dimethylaminoethyl acrylate, polyethyleneglycol monoacrylates and polyethylene glycol monomethacrylates and their corresponding methyl ethers thereof, or mixtures thereof;

(d) about 0–20% by weight of a cross-linking agent selected from the group of acrylate and methacrylate diesters of a compound selected from the group of dihydric alcohols, polyhydric alcohols, and phenols; methylene bisacrylamide; methylene bismethacrylamide; hexamethylene bisacrylamide; hexamethylene bismethacrylamide; divinyl esters; diallyl esters; or mixtures thereof;

(e) about 0 to 20% by weight of a C_2–C_{20} straight or branched aliphatic monoester or diester of an ethylenically unsaturated carboxylic acid.

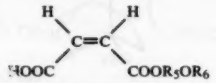
4,508,885

ELASTOMER OF ACRYLIC ESTER TYPE COPOLYMER

Kenichiro Nishiwaki; Tomio Sakai, and Takashi Ohkubo, all of Chiba, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 565,354
Claims priority, application Japan, Dec. 28, 1982, 57-227382
Int. Cl.³ C08F *22/20*
U.S. Cl. 526—318 **17 Claims**

1. An elastomer of acrylic ester type copolymer made up of a monomeric composition consisting of; 100 parts by weight of a mixture of the following three components, (A) 0–50% by weight of a vinyl carboxylate of the formula, $R_1COOCH{=}CH_2$ wherein R_1 is an alkyl group having 1 to 4 carbon atoms, (B) 0–30% by weight of ethylene and (C) 10–100% by weight of an alkyl acrylate of the formula, $CH_2{=}CHCOOR_2$ wherein R_2 is an alkyl group having 1 to 8 carbon atoms and/or an alkoxyalkyl acrylate of the formula, $CH_2{=}CHCOOR_3OR_4$ wherein R_3 is an alkylene group having 1 to 4 carbon atoms and R_4 is an alkyl group having 1 to 4 carbon atoms and 2–15 parts by weight of (D) a monoalkoxyalkyl maleate of the formula,



wherein R_5 is an alkylene group having 1 to 4 carbon atoms and R_6 is an alkyl group having 1 to 4 carbon atoms.

4,508,886

METHOD FOR MAKING ADHESIVE FROM BIOMASS

Janet A. Russell, Richland, and William F. Riemath, Pasco, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 30, 1984, Ser. No. 595,015
Int. Cl.³ C08L *97/00;* C07C *37/28;* C08G *8/28;* C08H *5/04*
U.S. Cl. 528—1 **4 Claims**

1. A method for making adhesive from lignin comprising:

a. preparing a liquefaction oil from lignin-bearing plant material by heating said lignin-bearing plant material to about 290 to 350 C. from about 0.25 to 1 hours at a pressure of about 1500 to 3000 psi in the presence of water and an alkaline catalyst;

b. recovering said liquefaction oil;

c. extracting a phenolic fraction from said liquefaction oil;

d. reacting said phenolic fraction with formaldehyde and thereby producing a phenol-formaldehyde resin; and

e. formulating an adhesive from said resin.

4,508,887

METHOD AND NOVEL CATALYST COMPOSITIONS FOR PREPARING POLYORGANOSILOXANES

Charles F. Kohl, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 1, 1983, Ser. No. 519,357
Int. Cl.³ C08G *77/06*
U.S. Cl. 528—21 **21 Claims**

1. A method for preparing a polyorganosiloxane, said method comprising the steps of

(I) forming a liquid reaction mixture comprising

(A) at least one hydroxyl-containing organosiloxane reactant containing repeating units of the formula $R_a^1SiO_{(4-a)/2}$ where each R^1 is individually selected from the group consisting of monovalent inertly substituted and monovalent unsubstituted hydrocarbon radicals containing from 1 to 6 carbon atoms and a has an average value of from 1 to 2;

(B) a catalytically effective amount of a catalyst composition consisting essentially of

(1) at least one salt derived from substantially equivalent amounts of an organic amine containing at least one primary, secondary or tertiary nitrogen atom and an acid selected from the group consisting of mono- and polyfunctional carboxylic acids, mono- and polyfunctional organosulfonic acids, phosphoric acid and sulfonic acid; and

(2) at least one unreacted acid selected from the group consisting of fluorinated alkanesulfonic acids and sulfuric acid; and

(C) an inert liquid reaction medium;

(II) heating said reaction mixture at a temperature of from 30° C. to the boiling point of the reaction mixture while removing the by-product water from the reaction mixture; and

(III) maintaining said temperature for a period of time sufficient to form said polyorganosiloxane.

4,508,888

RAPIDLY HARDENING ORGANOPOLYSILOXANE COMPOSITIONS COMPRISING POLYACYLOXYSILANE CROSS-LINKING AGENTS

Michel Letoffé, Sainte-Foy les Lyon; Roger Favre, and Patrice Perrin, both of Lyons, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jan. 25, 1984, Ser. No. 573,612
Claims priority, application France, Jan. 27, 1983, 83 01505
Int. Cl.[3] C08G 77/06
U.S. Cl. 528—23 16 Claims

1. An organopolysiloxane composition of matter, comprising (i) a polyhydroxylated polysiloxane, (ii) a polyacyloxysilane cross-linking agent therefor, and (iii) a hardening accelerator which comprises admixture of water or water donor and an alkali or alkaline earth metal phosphate, polyphosphate, or mixture thereof.

4,508,889

PREPARATION OF ISOCYANATE-TERMINATED POLYURETHANES CONTAINING AMINO SILANES

Gerry K. Noren, Hoffman Estates; Erwin S. Poklacki, Arlington Heights; Fred D. Hawker, Villa Park, and Janice M. Sich, Chicago, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 19, 1984, Ser. No. 632,613
Int. Cl.[3] C08G 18/38
U.S. Cl. 528—28 14 Claims

1. A process of incorporating polyalkoxy amino silane adhesion promoters into isocyanate-functional polyurethane resins formed by the reaction of a stoichiometric excess of organic polyisocyanate with an hydroxy-functional resin without producing cloudy and/or unstable resin solutions comprising, prereacting said hydroxy-functional resin with the alkoxy functionality of said amino silane in a reaction which liberates alcohol, and then adding a stoichiometric excess of said organic polyisocyanate to cause the isocyanate groups of said polyisocyanate to react with both the hydroxy groups and the amino hydrogen atoms present, whereby the previously troublesome clouding and instability which prevented use of effective amounts of the amino silane adhesion promoters is avoided.

4,508,890

PROCESS FOR THE PREPARATION OF THERMOPLASTIC AROMATIC POLYPHOSPHONATOCARBONATES WITH IMPROVED HEAT-AGING RESISTANCE, AND THEIR USE

Manfred Schmidt, Pittsburgh, Pa.; Ludwig Bottenbruch, and Dieter Freitag, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 224,077, Jan. 12, 1981, Pat. No. 4,401,802. This application May 12, 1983, Ser. No. 493,793
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1980, 3001863
The portion of the term of this patent subsequent to Aug. 3, 2000, has been disclaimed.
Int. Cl.[3] C08G 63/62, 79/04
U.S. Cl. 528—167 2 Claims

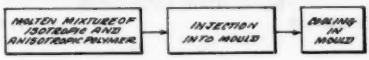
1. An aromatic thermoplastic polyphosphonatocarbonate having improved heat-ageing resistance produced by polycondensing the mixture consisting essentially of (A) at least one aromatic dihydroxy compound having 6 to 30 carbon atoms with (B) a diaryl carbonate having 6 to 14 carbon atoms in each aryl moiety and (C) a phosphonic acid diaryl ester having 6 to 14 carbon atoms in each aryl moiety in the presence of 10^{-7} to 2.10^{-2} mole percent, per mole of aromatic dihydroxy compound, of at least one catalyst selected from the group consisting of (a) tetra-C_1–C_{18}-alkyl titanates, (b) di-C_2–C_4-alkyl-tin oxides, (c) di-C_2–C_4-alkyl-di-C_1–C_4-alkoxy-tin compounds, (d) tetra-C_3–C_{18}-alkyl zirconates, (e) tri-C_2–C_{18}-alkyl vanadylates and (f) mixtures of germanium dioxide or titanium dioxide with at least one of the catalysts listed under (a) to (e), in a weight ratio of 1:3 to 3:1 at a temperature of from 80°–340° C. and under a pressure of from 600 to 0.1 mm Hg in an inert gaseous atmosphere, the molar ratio of (B) to (C) being from 5:95 to 95:5 and the molar ratio of (A) to the sum of (B) and (C) being from 0.91:1 to 0.99:1.

4,508,891

SHAPED ARTICLES FORMED FROM POLYMERS CAPABLE OF EXHIBITING ANISOTROPIC MELTS

Derrick S. Bailey, Welwyn; Frederic N. Cogswell, Welwyn Garden City, and Brian P. Griffin, St Albans, all of England, assignors to Imperial Chemical Industries, PLC, England

Continuation of Ser. No. 282,952, Jul. 13, 1981, abandoned. This application Feb. 2, 1983, Ser. No. 463,292
Claims priority, application United Kingdom, Jul. 16, 1980, 8023193
Int. Cl.[3] C08G 63/18; B29C 25/00; B29D 27/00
U.S. Cl. 528—191 6 Claims



1. A shaped article formed from a polymer which is capable of exhibiting anisotropy in the melt which has been prepared by obtaining a melt of the polymer in a temperature range over which the polymer exhibits a two-phase melt of the polymer molecules in both isotropic and anisotropic form and below the decomposition temperature of the polymer, forming a shaped article from said two-phase melt and cooling the melt at a rate sufficient to retain the disposition of the melt so that a mixture of polymer in oriented and random form is obtained in the shaped article.

4,508,892

COMPOSITIONS FOR COMPETITIVE PROTEIN BINDING ASSAYS INHIBITING NON-SPECIFIC INTERFERENCE

Robert A. Yoshida, Mountain View, Calif., assignor to Syva Company, Palo Alto, Calif.

Continuation of Ser. No. 017,874, Mar. 5, 1979, abandoned. This application Aug. 25, 1982, Ser. No. 411,180
Int. Cl.[3] C08B 37/02
U.S. Cl. 536—51 10 Claims

1. A support comprising a ligand analog-fluorescer conjugate covalently bonded to a macromolecular polysaccharide support having a molecular weight of at least 35,000 and not exceeding 2,000,000, said ligand analog-fluorescer conjugate comprising a fluorescent molecule that absorbs light having a wavelength longer than 350 nanometers with an extinction coefficient above 10^4 and emits light having a wavelength longer than 400 nanometers, said fluorescent molecule being covalently bonded to a ligand that is a modified hapten or antigen having a heavy atom capable of quenching said fluorescent molecule by inhibiting the fluorescence of said fluorescent molecule upon contact therewith.

4,508,893

PROCESS FOR THE PREPARATION OF A POWDERY CALCIUM CELLULOSE GLYCOLATE

Takahiro Koyama, Himeji; Haruo Matsumura, and Teturo Morita, both of Itami, all of Japan, assignors to Daicel Chemical Industries Ltd. and Nichirin Chemical Industries Ltd., both of, Japan

Filed Aug. 23, 1984, Ser. No. 643,648

Claims priority, application Japan, Aug. 25, 1983, 58-156187; Aug. 29, 1983, 58-158741

Int. Cl.[3] C08B *11/20, 11/00*

U.S. Cl. 536—85 8 Claims

1. A process for the preparation of a powdery calcium cellulose glycolate comprising reacting cellulose glycolic acid in wet form with a calcium reagent, drying and pulverizing the resultant product, the calcium reagent being calcium hydroxide or a combination of calcium hydroxide and calcium carbonate.

4,508,894

ACID-TYPE CARBOXYMETHYL CELLULOSE AND PROCESS FOR PREPARING THE SAME

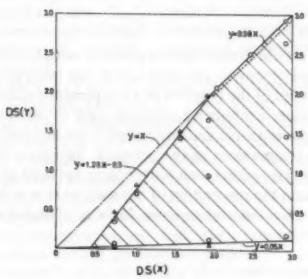
Takeo Omiya, Himeji, Japan, assignor to Daicel Chemical Industries Ltd., Osaka, Japan

Filed Dec. 23, 1983, Ser. No. 565,145

Claims priority, application Japan, Dec. 28, 1982, 57-230070; Jul. 23, 1983, 58-134860

Int. Cl.[3] C08B *11/00, 11/20*

U.S. Cl. 536—89 11 Claims



1. A carboxymethyl cellulose having a free acid form of carboxymethyl groups which is characterized by:

(a) having a total degree of substitution "x" by carboxymethyl groups of 0.42 to 3.00 per anhydrous glucose unit, the degree of substitution "y" by acid-form carboxymethyl groups being 5 to 100% of the total degree of substitution, provided that when "x" is less than 2.0, "y" shall be less than (1.25x−0.5), the remaining carboxymethyl groups being in the alkali salt form,

(b) having an average degree of polymerization of 50 to 1500, and

(c) being soluble in water.

4,508,895

PROCESS FOR THE PRODUCTION OF HYDROXYALKYL METHYL CELLULOSES

Klaus Balser, Walsrode, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 488,019, Apr. 25, 1983, abandoned. This application Feb. 13, 1984, Ser. No. 579,767

Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216786

Int. Cl.[3] C08B *11/193, 11/08*

U.S. Cl. 536—91 6 Claims

1. A process for the production of water-soluble hydroxyalkyl methyl cellulose having a molar substitution greater than about two, which comprises alkalization of cellulose with sodium hydroxide to form aqueous alkali cellulose; reducing the alkali content of said aqueous alkali cellulose to 0.3 to 0.8 mols of NaOH/mol of cellulose by washing with a solvent or solvent mixture; etherification of the resulting alkali cellulose with an alkylene oxide in an inert solvent different from the solvent used for washing out; and optionally purifying the product.

4,508,896

PROCESS FOR THE SIMULTANEOUS PRODUCTION OF 2-(2-AMINOALKOXY)ALKANOL AND MORPHOLINE

James H. Templeton, Austin, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 582,480, May 30, 1975, abandoned. This application Jul. 25, 1979, Ser. No. 60,266

Int. Cl.[3] C07D *295/02*

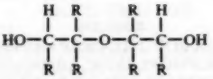
U.S. Cl. 544—106 2 Claims

1. A process for simultaneously producing a morpholine compound and a 2-(2-aminoethoxy)ethanol compound, comprising the steps of:

reacting an oxydialkanol with ammonia, in the presence of added hydrogen, over an hydrogenation-dehydrogenation catalyst selected from the group consisting of copper, nickel, chromium, cobalt, manganese, molybdenum, palladium, platinum, rhodium, oxides of said metals, and mixtures thereof;

said reaction taking place within a pressure range of from about 700 psig to about 2200 psig, and within a temperature range of from about 190° C. to about 230° C.;

said oxydialkanol having the formula:



in which R is selected from the group consisting of hydrogen and lower alkyl radicals; and

isolating said morpholine compound and said 2-(2-aminoethoxy)ethanol compound from the reaction products.

4,508,897

PREPARATION OF CHROMOGENIC AZAPHTHALIDES

Davor Bedekovic, Therwil, and Ian J. Fletcher, Magden, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

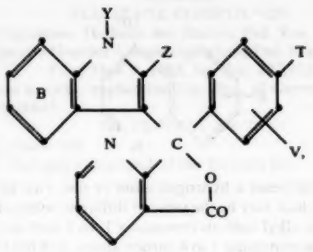
Continuation-in-part of Ser. No. 449,955, Dec. 15, 1982,. This application Jun. 7, 1983, Ser. No. 502,035

Claims priority, application Switzerland, Dec. 23, 1981, 8250/81; Dec. 23, 1981, 8251/81; Apr. 7, 1983, 1868/83

Int. Cl.[3] C07D *491/048*

U.S. Cl. 544—127 19 Claims

1. A process for the preparation of a 4-azaphthalide compound of the formula



wherein

Y is hydrogen, C_1–C_{12} alkyl which is unsubstituted or substituted by halogen, cyano, hydroxyl or lower alkoxy, acyl having 1 to 12 carbon atoms, benzyl or benzyl which is substituted by halogen, nitro, lower alkyl or lower alkoxy,

Z is hydrogen, lower alkyl or phenyl,

T is —OR_1 or,

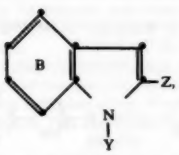
R_1 and R_2 independently of each other are hydrogen, C_1–C_{12} alkyl which is unsubstituted or substituted by halogen, cyano, hydroxyl or lower alkoxy, cycloalkyl, phenyl, benzyl or phenyl or benzyl which is substituted by halogen, nitro, cyano, lower alkyl, lower alkoxy or lower alkoxycarbonyl, or

R_1 and R_2 together with the connecting nitrogen atom, are a 5-membered or 6-membered heterocyclic radical and

V is hydrogen, halogen, hydroxyl, nitro, lower alkyl or lower alkoxy, and in which

the ring B is unsubstituted or substituted by halogen, nitro, cyano, lower alkyl, lower alkoxy, lower alkoxycarbonyl, amino, mono-(lower alkyl)-amino or di-(lower alkyl)-amino, which process comprises reacting quinolinic anhydride with an indole compound of the formula

(7a)



in which B, Y and Z are as defined, in the presence of an inorganic or organic metal salt of a polyvalent metal in an organic reaction medium consisting of a lower aliphatic monocarboxylic acid or a nitrile of this acid at a temperature of not more than 65° C., further condensing the resulting reaction product with a compound of the formula

in which T and V are as defined, and adjusting the pH value of the reaction mixture to not less than 6.

4,508,898

ANTIVIRAL TRIAZINE COMPOUNDS

(1a) **Kelvin K. Ogilvie, 54, Place de Bretagne, Candiac, Quebec, Canada (J5R 3M8)**

Continuation-in-part of Ser. No. 302,790, Sep. 16, 1981, which is a continuation-in-part of Ser. No. 187,631, Sep. 16, 1980, Pat. No. 4,347,360. This application Jun. 8, 1982, Ser. No. 386,430

Int. Cl.³ C07D *251/10, 251/46*

U.S. Cl. 544—211 **1 Claim**

1. The triazine compound 5-aza-1-[[2-benzyloxymethyl-[1-benzyloxy]-ethoxy]methyl]cytosine.

4,508,899

NICKEL COMPLEX PIGMENTS OF BIS-AZOMETHINES

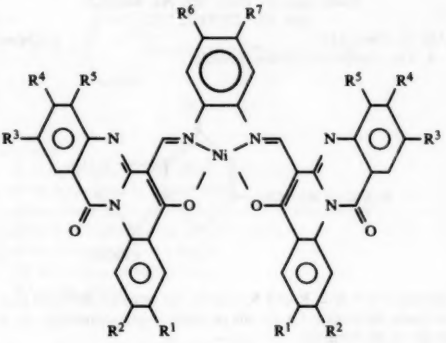
Terence R. Chamberlain, Verona, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Oct. 14, 1983, Ser. No. 542,019

Int. Cl.³ C07D *519/00;* **C09B** *170/00*

U.S. Cl. 544—225 **8 Claims**

1. A nickel complex having the structural formula



wherein each R^1, each R^3, and R^7 represent hydrogen, halogen, nitro, or lower alkyl, and each R^2, each R^4, and each R^5 and R^6 represent hydrogen or halogen.

4,508,900

CATIONIC COMPOUNDS OF THE NAPHTHALIMIDE SERIES, PROCESS FOR THEIR PREPARATION AND THEIR USE

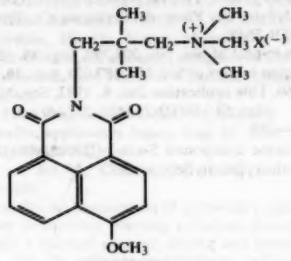
(5a) **Norbert Schönberger, Wehrheim; Erich Schinzel, Hofheim am Taunus; Thomas Martini, and Günter Rösch, both of Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

Continuation of Ser. No. 203,530, Nov. 3, 1980, abandoned. This application Sep. 13, 1982, Ser. No. 417,052

Int. Cl.³ C07D *221/14;* **D06P** *1/649;* **C09B** *17/04*

U.S. Cl. 546—99 **1 Claim**

1. A cationic compound of the formula:



wherein $X^{(-)}$ denotes a colorless anion.

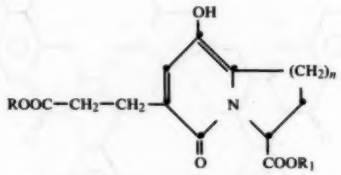
4,508,901

QUIUOLIZINE AND INDOLIZINE ENZYME INHIBITORS

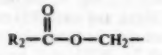
Jon S. Mynderse, Indianapolis, Ind., and Sean C. O'Connor, Jamesville, N.Y., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 19, 1982, Ser. No. 409,763
Int. Cl.³ C07D *221/02*
U.S. Cl. 546—112 **3 Claims**

1. The compound of the formula



wherein n is 1 or 2, R and R_1 can be the same or different and are each hydrogen, C_1–C_6 alkyl, indan-5-yl, phthalidyl, or a group of the formula



wherein R_2 is C_1–C_4 alkyl, phenyl, halophenyl, or methylphenyl, and when either or both of R and R_1 are hydrogen the pharmaceutically acceptable non-toxic salts thereof.

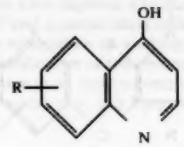
4,508,902

PROCESS FOR THE PREPARATION OF 4-HYDROXYQUINOLINES

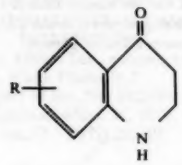
Dominique Pétré, Paris, and Daniel Michelet, Tassin, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Jun. 16, 1983, Ser. No. 504,954
Claims priority, application France, Jun. 17, 1982, 82 10615
Int. Cl.³ C07D *215/22*
U.S. Cl. 546—153 **6 Claims**

1. A process for the preparation of a 4-hydroxyquinoline of the formula:



in which R represents a hydrogen atom or one, two or three substituents, which may be the same or different, selected from halogen atoms, alkyl radicals containing 1' to 4 carbon atoms, alkoxy radicals containing 1 to 4 carbon atoms, and the trifluoromethyl radical, the substituent(s) being in the 2-, 3-, 5-, 6-, 7- or 8-position, which comprises oxidising a 1,2,3,4-tetrahydroquinolin-4-one of the formula:



in which R is as hereinbefore defined, in a basic medium but in the absence of a catalyst, under pressure, by means of excess oxygen or air at a temperature between 80° and 150° C.

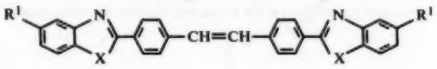
4,508,903

PROCESS FOR THE PREPARATION OF 4,4'-BIS[BENZ(OX, OTHI OR IMID)AZOL-2-YL]STILBENES

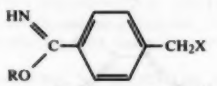
Lorenz Heiss, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,090
Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216723
Int. Cl.³ C07D *413/10, 417/10*
U.S. Cl. 548—156 **3 Claims**

1. A process for the preparation of a 4,4'-bis[benz(ox, othi or imid)azol-2-yl]stilbene of the formula



in which the R^1 groups are identical or different and denote hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyl, chlorine, bromine, nitro or sulfo and X denotes oxygen, sulfur or NH, which comprises reacting an alkyl (4-halomethyl-)iminobenzoate of the formula



or its HCl or HBr salts, R denoting C_1–C_4-alkyl or C_1–C_4-alkoxyethyl and X denoting Cl or Br, with o-aminophenol, o-aminothiophenol or o-phenylenediamine and allowing the 2-benz(ox, othi or imid)azol-4-ylhalomethylbenzene obtained thereby to react with an approximately equivalent amount of sodium tert.-butylate.

4,508,904

FLUORANE COMPOUNDS

Horst Bingmann, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

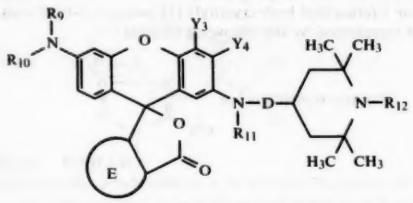
Filed May 9, 1983, Ser. No. 492,822

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 3218645

Int. Cl.³ C07D *493/10*

U.S. Cl. 546—196 **3 Claims**

1. A fluorane compound of the formula (2)



(2)

in which:

R_9 and R_{10} independently of each other each denote an alkyl group having 1–4 carbon atoms or a benzyl group;

R_{11} and R_{12} independently of each other each denote a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, or a benzyl, acetyl, propionyl or benzoyl group;

Y_3 denotes a hydrogen chlorine, or bromine atom, an alkoxy group having 1 to 4 carbon atoms, or a phenyl group;

Y_4 denotes a hydrogen atom or an alkyl or alkoxy group having 1 to 4 carbon atoms; provided, that one of Y_3 and Y_4 is hydrogen, if the other of these two substituents is not hydrogen;

D denotes a direct bond or the 1,2-ethylene group; and

E denotes a 1,2-phenylene radical, unsubstituted or substituted with chlorine or bromine.

4,508,905

SUBSTITUTED 2-(-BENZIMIDAZOLYL)PYRIDINES

Ulf K. Junggren, Mölnlycke, and Sven E. Sjöstrand, Kungsbacka, both of Sweden, assignors to Aktiebolaget Hassle, Mölndal, Sweden

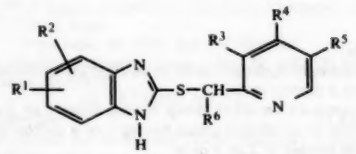
Continuation of Ser. No. 369,404, Apr. 19, 1982, abandoned, which is a division of Ser. No. 150,965, May 19, 1980, Pat. No. 4,337,257, which is a division of Ser. No. 027,277, Apr. 15, 1979, Pat. No. 4,255,431. This application Apr. 6, 1983, Ser. No. 482,513

Claims priority, application Sweden, Apr. 14, 1978, 7804231

Int. Cl.³ C07D *401/12*

U.S. Cl. 546—271 **3 Claims**

1. A compound of the formula



wherein R^1 and R^2 are the same or different and are selected from the group consisting of hydrogen, alkyl having from 1–7 carbon atoms, halogen, carbomethoxy, carboethoxy, alkoxy having up to 5 carbon atoms and alkanoyl having up to 4 carbon atoms, R^6 is selected from the group consisting of hydrogen, methyl and ethyl, R^3 and R^5 are the same or different and are selected from the group consisting of hydrogen, methyl, methoxy, ethoxy, methoxyethoxy, and ethoxyethoxy and R^4 is selected from the group consisting of methoxy, ethoxy, methoxyethoxy and ethoxyethoxy.

4,508,906

3-AMINO-4-(2-PYRIDYLOXY)PHENOXYALKANOIC AND ALKENOIC ACID ESTERS

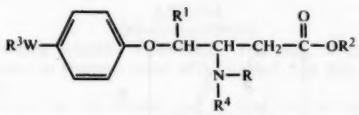
Joe T. Bamberg, Redwood City, and Gustave K. Kohn, Palo Alto, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 430,057, Sep. 30, 1982, abandoned. This application Feb. 21, 1984, Ser. No. 581,859

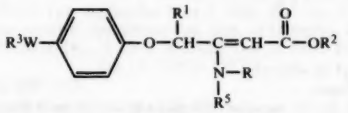
Int. Cl.³ C07D *213/64*; A01N *43/40*

U.S. Cl. 546—300 **10 Claims**

1. A compound of the following formula (A) or (B):



(A)



(B)

wherein,

R is hydrogen, lower alkyl or phenyl;

R^1 is hydrogen or lower alkyl;

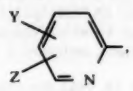
R^2 is lower alkyl, lower alkenyl or lower alkynyl;

R^4 is hydrogen, lower alkyl or phenyl;

R^5 is lower alkyl or phenyl;

W is oxygen or sulfur; and

R^3 is the group



in which,

each of Y and Z is independently hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, lower haloalkoxy, bromo, chloro, fluoro, nitro or cyano.

4,508,907

2,3-DICHLORO-5-TRICHLOROMETHYLPYRIDINE

David Cartwright, Woodley, England, assignor to Imperial Chemical Industries, PLC, London, England

Continuation of Ser. No. 29,341, filed as PCT GB 78/00008, Aug. 10, 1978, published as WO 79/00094, Mar. 8, 1979, § 102(e) date Apr. 11, 1979. This application Sep. 30, 1982, Ser. No. 431,373

Claims priority, application United Kingdom, Aug. 12, 1977, 34039/77; Oct. 26, 1977, 44541/77; Feb. 9, 1978, 5230/78

Int. Cl.³ C07D *213/26*

U.S. Cl. 546—345 **1 Claim**

1. 2,3-dichloro-5-trichloromethylpyridine.

4,508,908

2-ALKYL-3-HALOISOTHIAZOLIUM SALTS AND THEIR DERIVATIVES

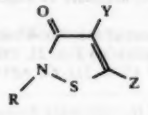
Joseph A. Virgilio; Milton Manowitz, both of Wayne, and Emanuel Heilweil, Fairfield, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 952,038, Oct. 16, 1978, Pat. No. 4,281,136, which is a continuation-in-part of Ser. No. 854,456, Nov. 25, 1977, abandoned. This application Sep. 29, 1980, Ser. No. 192,123

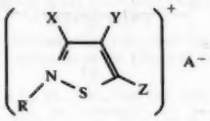
Int. Cl.³ C07D *275/02*

U.S. Cl. 548—213 46 Claims

1. A process for preparing a 4-isothiazolin-3-one of the formula:



from a 2-alkyl-3-haloisothiazolium salt of the formula:



wherein:

R is alkyl or alkenyl;

X is halogen;

Y and Z are the same or different and are selected from the group consisting of hydrogen, lower alkyl, halogen, nitro, cyano and carboalkoxy, and

A^- is a suitable anion;

which comprises reacting said 2-alkyl-3-haloisothiazolium salt with a suitable oxygen source wherein the source of oxygen is the carbonyl group of a urea or an amide, the hydroxyl group of an alcohol or water, or the oxygen of a sulfoxide or a sulfate.

4,508,909

SYNTHESIS OF HYDROXYETHYLTETRAZOLETHIOL AND ETHERIFIED INTERMEDIATES THEREFOR

Wataru Nagata, Hyogo; Yasuhiro Nishitani, Osaka, and Hisao Sato, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Mar. 15, 1983, Ser. No. 475,410

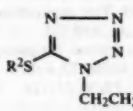
Claims priority, application Japan, Mar. 24, 1982, 57-47846

Int. Cl.³ C07D *257/04*

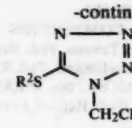
U.S. Cl. 548—251 18 Claims

1. A process for preparing optionally protected 1-hydroxyethyl-1H-tetrazole-5-thiol or the mercaptide salt thereof which comprises the steps of heating an etherified N-hydroxyethyldithiocarbamate ester (I) in the presence of an azide in an inert solvent to give the corresponding etherified 1-(hydroxyethyl)-1H-tetrazole-5-thiol or the mercaptide salt thereof (II) and then, if required, removing the ether-forming group to give the free alcohol compound (III), the compounds I, (II) and (III) having the following formulae:

$ROCH_2CH_2NHCSSR^1$ (I)

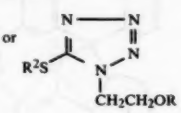
 (II)

-continued

 (III)

wherein R is an ether forming group selected from the group consisting of tertiary alkyl, triarylmethyl, 1-(C_1 to C_6-alkoxy)-C_1 to C_6-alkyl and C_4 to C_6-2-oxacycloalk-1-yl, R^1 is an ester forming group and R^2 is hydrogen or an alkali metal or alkaline earth metal salt forming group.

17. An N-(etherified hydroxyethyl)dithiocarbamic acid alkyl ester or 1-(etherified hydroxyethyl)-1H-tetrazole-5-thiol compound represented by the following formula

$ROCH_2CH_2NHCSSR^1$ or 

wherein R is an ether forming group,

R^1 is alkyl and

R^2 is hydrogen or alkali metal.

4,508,910

HERBICIDAL 4-BENZOYL-5-HYDROXY-PYRAZALES

Takuo Konotsune, Hiromachi, and Katsuhiko Kawakubo, Yasumachi, both of Japan, assignors to Sankyo Company Ltd., Tokyo, Japan

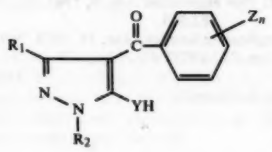
Continuation of Ser. No. 953,357, Oct. 23, 1978, abandoned, which is a continuation of Ser. No. 838,083, Sep. 30, 1977, Pat. No. 4,146,726, which is a division of Ser. No. 558,682, Mar. 17, 1975, Pat. No. 4,063,925. This application Oct. 23, 1980, Ser. No. 199,824

Claims priority, application Japan, Mar. 28, 1974, 49-34939

Int. Cl.³ A01N *43/56*; C07D *231/20*

U.S. Cl. 548—367 3 Claims

1. An agriculturally compatible compound having the formula



wherein

R_1 represents hydrogen atom or an alkyl group having from 1 to 3 carbon atoms,

R_2 represents an alkyl group having from 1 to 3 carbon atoms or an alkenyl group having 3 or 4 carbon atoms,

n is an integer of 2 or 3 or 4,

Z represents a halogen atom, nitro group, an alkyl group having from 1 to 4 carbon atoms, and when n is 2 or 3 or 4, Z's may be the same or different, and

Y represents oxygen atom,

and acid addition salts thereof.

4,508,911
AMINE INTERMEDIATES FOR ANALGESIC COMPOUNDS

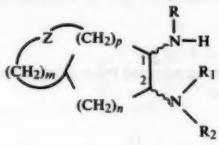
Lester J. Kaplan, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 390,462, Jun. 21, 1982, Pat. No. 4,438,130, which is a continuation-in-part of Ser. No. 320,635, Nov. 12, 1981, abandoned. This application Feb. 14, 1984, Ser. No. 580,060

Int. Cl.³ C07D *307/94, 311/96*

U.S. Cl. 548—407 12 Claims

1. A compound of the formula



(II)

wherein

the wavy line bonds indicate a cis or trans relationship of the two nitrogen-containing groups at positions 1 and 2 of the cycloaliphatic ring;

p is a whole number integer 0, 1, 2, 3 or 4, and

n is a whole number integer 1, 2, 3 or 4, so that the resulting cycloaliphatic ring containing them has 5, 6 or 7 carbon atoms;

m is 3 or 4;

R is hydrogen or C_1 to C_3-alkyl;

R_1 and R_2, taken separately are each hydrogen, C_1 to C_3-alkyl or allyl;

R_1 and R_2, taken together with the nitrogen to which they are bonded, complete a ring selected from the group consisting of

azetidinyl,

pyrrolidinyl,

piperidinyl,

pyrrolyl,

3-pyrrolin-1-yl,

3-azabicyclo[3.1.0]hexan-3-yl, and

3-azabicyclo[3.2.0]heptan-3-yl;

Z is selected from the group consisting of oxygen, bivalent sulfur and sulfinyl.

4,508,912
PROCESS FOR PRODUCING N-CARBOBENZOXY-L-ASPARTIC ANHYDRIDE

Tetsuo Yamatani, Yokkaichi; Toyoto Hijiya, Yokosuka; Hideo Takeda, Inagi; Koji Shibuya, Ashiya, and Kiichiro Tanaka, Tokyo, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Mar. 29, 1983, Ser. No. 479,898

Claims priority, application Japan, Mar. 30, 1982, 57-51628; Mar. 30, 1982, 57-51629

Int. Cl.³ C07D *307/66*

U.S. Cl. 549—253 11 Claims

1. In a process for producing N-carbobenzoxy-L-aspartic acid anhydride which comprises reacting N-carbobenzoxy-L-aspartic acid with acetic anhydride, the improvement which consists of conducting the reaction in the presence of a catalytic amount of a metal oxide, a metal hydroxide, a metal salt of an acid, an organobasic compound or an acid having a dissociation constant of 5×10^{-2} or more.

4,508,913
DIALKOXYMETHYL-BUTYROLACTONES

Dieter Arlt, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

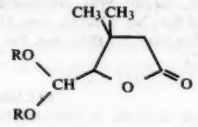
Filed Aug. 5, 1983, Ser. No. 520,676

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231815

Int. Cl.³ C07D *407/04, 307/32*

U.S. Cl. 549—320 1 Claim

1. A dialkoxymethyl-butyrolactone of the formula



in which

R is C_{1-4}-alkyl, or both radicals R together are ethylene.

4,508,914
3H-FURANONES

Hans-Georg Schmidt, Niederkassel, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

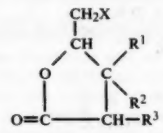
Division of Ser. No. 282,689, Jul. 13, 1981, Pat. No. 4,424,369, which is a division of Ser. No. 218,593, Dec. 19, 1980, Pat. No. 4,348,535. This application May 5, 1982, Ser. No. 375,060

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952068; Dec. 3, 1980, 3045455; Dec. 6, 1980, 3046059

Int. Cl.³ C07D *307/28*

U.S. Cl. 549—323 5 Claims

1. A substituted lactone of the formula



wherein X is chlorine, bromine or hydroxyl and R^1, R^2 and R^3 are the same or different radicals from the group of hydrogen and C_1 to C_{10} alkyl radicals, at least one of the radicals R^1 and R^2 being such an alkyl radical.

4,508,915
SILYLALKYL THIOALKANOATES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Rolf-Dieter Acker, Leimen; Adolf Parg, Bad Duerkheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

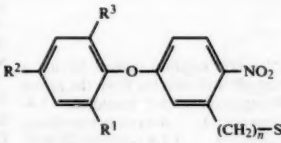
Filed Mar. 18, 1983, Ser. No. 476,578

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210336

Int. Cl. C07F *7/08, 7/10*

U.S. Cl. 556—418 9 Claims

1. A silylalkyl thioalkanoate of the formula



(I)

where R^1 is hydrogen or halogen, R^2 is halogen, trihalomethyl,

trihalomethoxy or trihalomethylmercapto, R^3 is hydrogen or halogen, the radicals R^4 are identical or different and are each C_1–C_6-alkyl or phenyl, Q is straight-chain or branched C_1–C_8-alkylene and n is 0 or 1.

4,508,916

CURABLE SUBSTITUTED URETHANE ACRYLATES

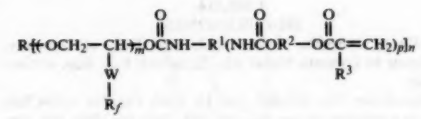
Richard G. Newell, and Stephen F. Wolf, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 255,739, Apr. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 028,966, Apr. 11, 1979, abandoned. This application May 20, 1983, Ser. No. 496,471

Int. Cl.[3] **C07F** *7/18;* **C07C** *125/073, 125/077*

U.S. Cl. 556—420 **13 Claims**

1. A radiation curable urethane acrylate or methacrylate compound having an aliphatic backbone, said backbone having at least one ether or polyether group with at least one pendent fluorinated organic group attached thereto, said urethane acrylate or methacrylate having the formula:

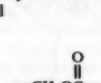


wherein

R is a monomeric or polymeric organic radical having a valence of n selected from (a) a monomeric aliphatic radical having 1 to 18 carbon atoms, (b) a polymeric aliphatic radical having an equivalent weight of less than 1000 for each valence, (c) cyclohexyl, (d) 1,4-cyclohexanediyl, or (e) 1,4-cyclohexanedimethyl;

n is an integer from 1 to 6;

W is a connecting group selected from a single bond, —CH_2—O—CH_2—, and



R^1 is an organic radical selected from the group consisting of aliphatic, cycloaliphatic and aromatic radicals;

R^2 is a divalent aliphatic group having 2 to 6 carbon atoms;

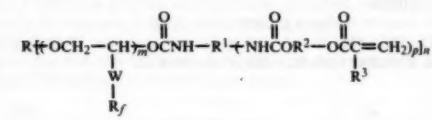
R^3 is hydrogen or methyl;

m is a number having a value from 1 to 20;

p is one or two; and

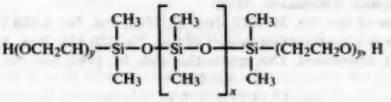
R_f is a monovalent fluorinated organic radical having 1 to 18 carbon atoms and 35 to 85 weight percent of fluorine.

8. A radiation curable urethane acrylate or methacrylate compound having an aliphatic backbone, said backbone having at least one ether or polyether group with at least one pendent fluorinated organic group attached thereto, said urethane acrylate or methacrylate having the formula:



wherein

R is a monomeric or polymeric organic radical having a valence of n derived from alcohol selected from the group consisting of ethyleneglycol, 1,6-hexanediol, 1,4-butanediol, tetraethyleneglycol, 1,4-cyclohexanedimethanol, 1,4-cyclohexanediol, 1,1,6,6-tetrahydroperfluorohexanediol, trimethylolpropane, 1,2,6-hexanetriol, allylalcohol, pentaerythritol, sorbitol, polyoxyethylene glycol having a molecular weight of less than 2000, and diorgano polysiloxanediol having the formula:



wherein

$y+y'=26$

$x=10$

n is an integer 1, 2, 3, 4, or 6;

W is a connecting group selected from a single bond, —CH_2—O—CH_2—, and

R^1 is an organic radical selected from aliphatic, cycloaliphatic, or aromatic radicals;

R^2 is a divalent aliphatic group having 2 to 6 carbon atoms;

R^3 is hydrogen or methyl;

m is a number having a value from 1 to 20;

p is one or two; and

R_f is a monovalent fluorinated organic radical having 1 to 18 carbon atoms and 35 to 85 weight percent of fluorine.

4,508,917

PREPARATION OF ALKYL ADIPATES

Jean Jenck, Villeurbanne, France, assignor to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Mar. 29, 1983, Ser. No. 479,937

Claims priority, application France, Apr. 7, 1982, 82 06225

Int. Cl.[3] **C07C** *67/38*

U.S. Cl. 560—204 **18 Claims**

1. A process for the preparation of an alkyl adipate, comprising reacting an alcohol and carbon monoxide with an alkyl pentenoate in the presence of (i) a catalytically effective amount of a cobalt catalyst, (ii) a tertiary nitrogen base, and (iii) hydrogen, with the hydrogen comprising at least 0.1% by volume of the carbon monoxide, and said reaction being carried out in (iv) an aromatic hydrocarbon or an alkyl, aryl or aralkyl substituted aromatic hydrocarbon reaction medium.

4,508,918

METHOD OF PRODUCING CYCLOHEXANE DERIVATIVES DIRECTLY FROM AROMATIC HYDROCARBONS

Yutaka Yasuhara; Masaki Nishino, and Seikichi Matsuhisa, all of Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 822,380, Aug. 5, 1977, abandoned, which is a division of Ser. No. 581,788, May 29, 1975, Pat. No. 4,067,915. This application Nov. 20, 1979, Ser. No. 95,956

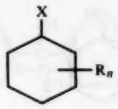
Claims priority, application Japan, Jun. 5, 1974, 49-62844; Nov. 7, 1974, 49-127523

The portion of the term of this patent subsequent to Jul. 15, 1997, has been disclaimed.

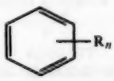
Int. Cl.[3] **C07C** *29/19, 29/20, 35/08, 67/04, 69/06, 69/14, 69/24*

U.S. Cl. 560—241 **11 Claims**

1. A process for producing a cyclohexane derivative having the general formula



wherein X is selected from the group consisting of hydroxyl, and OAc groups, wherein Ac is a residue selected from the group consisting of formyl, acetyl, and propionyl groups, R is a lower alkyl group having 1 to 3 carbon atoms, and n is an integer of from 0 to 2, which process comprises reacting an aromatic hyrocarbon having the general formula



wherein R and n are the same as above, with hydrogen and a compound having the general formula HX, wherein X is the same as above, in the presence of a strong acid and a hydrogenation catalyst which contains at least one noble metal of Group VIII metals at a pressure of 0.01–500 kg/cm^2 and at a temperature of 0°–300° C.

4,508,919

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE CYCLOPROPANE CARBOXYLIC ACIDS

Elemér Fogassy; László Toke; Ferenc Faigl; Rudolf Sóós; József Bozzay; Rezso Kolta; József Nemes, and Péter Bencsik, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

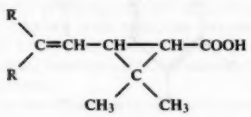
Filed Nov. 25, 1983, Ser. No. 555,187

Claims priority, application Hungary, Nov. 25, 1982, 3789/82

Int. Cl.^{3} C07B *19/00*

U.S. Cl. 562—401 **9 Claims**

1. Process for the preparation of enantiomers of trans vinylcyclopropane carboxylic acids of the formula I



wherein R is methyl or chlorine, by resolution of racemic trans compound or mixture of racemic trans and cis compounds, wherein an effective amount of (+)- or (−)-N-(1-formamido-2,2,2-trichloro.ethyl)-piperazine is used as a resolving agent in a polar solvent, then the crystallizing salt of (+)-trans carboxylic acid and (−)-resolving agent or (−)-trans carboxylic acid and (+)-resolving agent is separated from the mother liquor by filtration then the enantiomers are obtained by acidifying the mother liquor or the salts suspended in water followed by extraction with a solvent and evaporation.

4,508,920

PROCESS FOR THE PREPARATION OF AROMATIC HYDROXYCARBOXYLIC ACIDS

Gerhard Stopp, Leverkusen; Horst Karkossa, Leichlingen, and Viktor Trescher, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,501

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210597

Int. Cl.^{3} C07C *51/15*

U.S. Cl. 562—423 **10 Claims**

1. In a process for the preparation of an aromatic hydrocarboxylic acid by contacting alkali metal salt of an aromatic hydroxy compound in the solid phase with carbon dioxide, and thereafter converting the resultant reaction product to the free acid, the improvement which comprises contacting said alkali metal salt of said aromatic hydroxy compound in the form of granules having a diameter of 0.2 to 5 mm and a specific surface area of 1 to 6 m^2 per gram in a fluidized bed with carbon dioxide at a temperature of 120° to 300° C. with continuous removal, by means of excess carbon dioxide, of the aromatic hydroxy compound which is formed, until at least 40% of said alkali metal salt with aromatic hydroxy compound has been converted into the alkali metal salt with the corresponding hydroxycarboxylic acid, the process being carried out employing a reaction mixture consisting essentially of said alkali metal salt of aromatic hydroxy compound and said carbon dioxide.

4,508,921

PROCESS FOR PREPARATION OF ALPHA-ALKYL AMINO ACIDS

Joseph S. Amato, Brooklyn, N.Y.; Leonard M. Weinstock, Belle Mead, and Sandor Karady, Mountainside, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 28, 1984, Ser. No. 625,761

Int. Cl.^{3} C07C *51/09*

U.S. Cl. 562—443 **3 Claims**

1. A process for preparing an optically active acyclic or open chain α-alkyl-α-amino acid from the corresponding optically active acyclic α-amino acid which comprises:

(1) converting an optically active acyclic α-amino acid to a 2-aryloxazolidinone compound in which the non-hydrogen substituent at the 4-position and the aryl group are in a cis relationship by:

(a) reacting an optically active nitrogen protected α-amino acid with an aromatic aldehyde in the presence of an acid catalyst, or

(b) reacting an optically active unprotected α-amino acid with an aromatic aldehyde in alkaline solution to produce a Schiff base of the amino acid salt and thereafter reacting the Schiff base with an acylating agent,

(2) stereospecifically alkylating said 2-aryloxazolidinone compound by first forming an alkali metal enolate by reacting the oxazolidinone compound with a strong base at greatly reduced temperatures followed by reacting the enolate with an alkylating agent, and

(3) generating the α-alkyl-α-amino acid from the alkylated 2-aryloxazolidinone by alkaline hydrolysis to open the ring followed by hydrolytic or reductive removal of the protecting group.

4,508,922

PROCESS FOR THE PREPARATION OF OPTIONALLY HALOGENATED ANILINES

Serge Ratton, Lyons, France, assignor to Rhone-Poulenc Agrochimie, Lyons, France

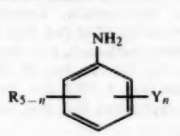
Filed Jun. 28, 1983, Ser. No. 508,716

Claims priority, application France, Jun. 29, 1982, 82 11617

Int. Cl.^{3} C07C *85/04*

U.S. Cl. 564—407 **14 Claims**

1. A process for the preparation of an optionally halogenated aniline of the general formula:

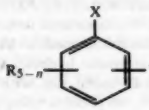


in which

Y represents one or more identical or different halogen atoms,

R represents one or more substituents chosen from the group comprising a hydrogen atom, an alkyl radical containing from 1 to 4 carbon atoms or an alkoxy radical containing from 1 to 4 carbon atoms, and

n is an integer from 0 to 5, by the ammonolysis of a halogenobenzene of the formula:



in which:

Y and R have the same meanings as above and

X represents a halogen atom, in the presence of copper as a catalyst and of a complexing agent for the copper, the improvement which comprises conducting the ammonolysis with an aqueous ammonia solution and using 8-hydroxyquinoline and/or an 8-hydroxyquinoline derivative as the complexing agent.

4,508,923

OXIDATION OF HYDROCARBONS

Paul D. Taylor, Berwyn, and Michael T. Mocella, West Chester, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 22, 1983, Ser. No. 468,605

Int. Cl.³ C07C *45/53*

U.S. Cl. 568—311 **19 Claims**

1. In a process for producing a mixture containing decomposition products of an organic hydroperoxide wherein a hydrocarbon is oxidized in the presence of a molecular oxygen containing gas to provide a reation mixture containing the corresponding hydroperoxide of said hydrocarbon and said hydroperoxide is decomposed in the presence of starting hydrocarbon to provide a mixture containing reaction products of such decomposition reaction, including an alcohol and/or ketone products, the improvement which comprises conducting the oxidation reaction by contacting the hydrocarbon with a molecular oxygen containing gas at a temperature of from about 50° C. to about 250° C. in the presence of a catalytic amount of an admixture of chromium and ruthenium compounds which are soluble in said reaction mixture, and conducting the decomposition reaction by contacting a reaction mixture containing the hydroperoxide of the hydrocarbon starting material at a temperature of from about 25° C. to about 250° C. in the presence of a diluent with a catalytic amount of said catalyst admixture, optionally in the presence of a molecular oxygen containing gas.

4,508,924

PREPARATION OF O-ACYLPHENOLS AND P-ACYLPHENOLS

Josef Mueller, Ludwigshafen; Walter-Wielant Wiersdorff, Mutterstadt; Werner Kirschenlohr, Ludwigshafen, and Gerd Schwantje, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

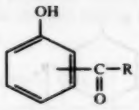
Continuation of Ser. No. 344,014, Jan. 29, 1982, abandoned. This application Nov. 1, 1983, Ser. No. 548,215

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1981, 3108076

Int. Cl.³ C07C *45/46*

U.S. Cl. 568—322 **9 Claims**

1. A process for the preparation of o-acylphenols and p-acylphenols of the formula



I

where the acyl radical is in the o-position and/or p-position to the hydroxyl group, and R is an aliphatic or cycloaliphatic radical, wherein phenol is reacted with an acid halide of the formula

II

where R has the above meanir.gs and X is halogen, in an amount of from 0.5 to 1.5 moles permole of phenol, in the presence of from 0.5 to 1.5 moles of aluminum chloride per mole of phenol, and of a halobenzene as the solvent, initially at from 15° to 55° C. and then at from 55° to 200° C.

4,508,925

3-PHENYL-PROPIONALDEHYDES

Yvo Crameri, Oberwil; Paul A. Ochsner, Geneva, and Peter Schudel, Grüt-Wetzikon, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

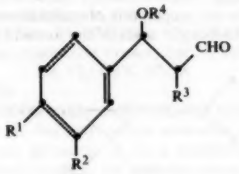
Division of Ser. No. 322,135, Nov. 17, 1981, Pat. No. 4,435,585. This application Nov. 9, 1983, Ser. No. 549,950

Claims priority, application Switzerland, Nov. 21, 1980, 8621/80

Int. Cl.³ C07C *47/228*

U.S. Cl. 568—442 **3 Claims**

1. A compound of the formula



wherein:

R^1 represents isopropyl, n-butyl, sec.butyl, isobutyl, tert.butyl, methoxy or, together with R^2, represents methylene dioxy

R^2 represents hydrogen or, together with R^1, represents methylene dioxy;

R^3 represents hydrogen or methyl; and

R^4 represents methyl or ethyl.

4,508,926

4-HYDROXY-BENZHYDROLS, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Edit Toth; Jozsef Torley; Gyorgy Fekete; László Szporny; Laszlo Vereczkey; Eva Pàlosi; Imre Klebovich; Pal Vittay; Sandor Gorog, and Istvan Hajdu, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

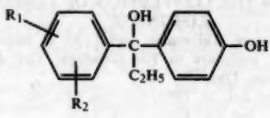
Filed Dec. 27, 1983, Ser. No. 565,840

Claims priority, application Hungary, Dec. 28, 1982, 4188/82

Int. Cl.³ C07C *39/11*

U.S. Cl. 568—766 **4 Claims**

1. A 4-Hydroxy-α-ethyl-benzhydrol compound of the formula (I)



(I)

wherein

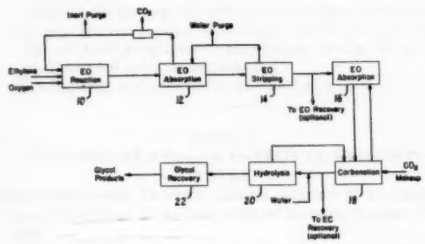
R_1 and R_2 independently represent hydrogen, halogen, trihalomethyl, alkyl having from one to 4 carbon atoms or alkoxy having from one to 4 carbon atoms, but when R_1 is hydrogen, R_2 is other than hydrogen or a 3-trifluoromethyl group, or when R_1 is a 2-methyl group, R_2 is other than an 5-methyl group.

4,508,927

PREPARATION OF GLYCOLS FROM ETHYLENE OXIDE

Vijay S. Bhise, Bloomfield, N.J., and Harold Gilman, Millwood, N.Y., assignors to The Halcon SD Group, Inc., New York, N.Y.

Filed Aug. 2, 1983, Ser. No. 519,653
Int. Cl.³ C07C *29/00, 31/20*
U.S. Cl. 568—858 **8 Claims**



1. A process for preparing ethylene glycols comprising:

(a) reacting ethylene with molecular oxygen in the vapor phase over a supported silver catalyst to produce an effluent comprising ethylene oxide, unreacted ethylene, carbon oxides and water;

(b) scrubbing said effluent of (a) with a recirculating aqueous stream to absorb the ethylene oxide formed in said reaction of (a) to produce an enriched aqueous stream;

(c) stripping at a lower pressure than the scrubbing of (b) in a first vapor-liquid contacting column the enriched aqueous stream of (b) to remove the absorbed ethylene oxide therefrom in a vapor stream, and returning the stripped aqueous stream to step (b);

(d) partially condensing the ethylene oxide-containing vapor stream of (c) to remove the bulk of the water therefrom, separating water-containing liquid condensed therefrom, and returning said liquid as reflux to said first column;

(e) scrubbing the ethylene oxide-containing vapor after separating said condensed water in a second vapor-liquid contacting column with an aqueous solution comprising ethylene carbonate, ethylene glycol, and carbonation catalyst to absorb substantially all of the ethylene oxide and water content of said vapor to form an enriched ethylene carbonate solution;

(f) adding carbon dioxide to said enriched solution of (e) and thereafter reacting ethylene oxide and carbon dioxide contained in said solution in the presence of an effective amount of a carbonation catalyst to form ethylene carbonate;

(g) stripping the reacted solution of (f) to remove unreacted ethylene oxide and carbon dioxide therefrom, dividing the stripped solution in at least two portions, and recirculating the first portion as scrubbing solution to step (e);

(h) adding water to the second portion of the stripped solution of (g) and reacting ethylene carbonate with water in the presence of said carbonation catalyst to form ethylene glycols; and

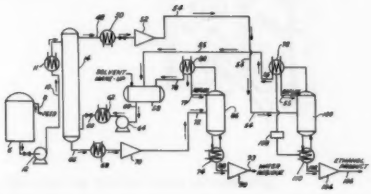
(i) separating the ethylene glycols formed in (h) and returning said carbonation catalyst to step (f).

4,508,928

ETHANOL EXTRACTION PROCESS

John G. Victor, Indian Head Park, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed May 3, 1982, Ser. No. 374,402
Int. Cl.³ C07C *29/86*
U.S. Cl. 568—916 **7 Claims**



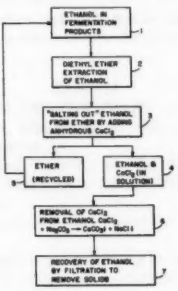
1. A process for extracting ethanol from an aqueous solution containing ethanol which comprises contacting the solution with propylene (propene) solvent at conditions of pressure and temperature sufficient to maintain the solvent in the liquid state, and to selectively extract at least a portion of the ethanol from the solution and to provide two separate liquid phases including a solvent phase containing the extracted ethanol.

4,508,929

RECOVERY OF ALCOHOL FROM A FERMENTATION SOURCE BY SEPARATION RATHER THAN DISTILLATION

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1983, Ser. No. 455,362
Int. Cl.³ C07C *29/76, 29/86, 31/08;* C12P *7/06*
U.S. Cl. 568—923 **1 Claim**



1. A method of recovering ethanol from a fermentation source by separation rather than by distillation, said method comprising:

i. providing a fermentation source which contains ethanol in a mixture of fermentation products in said fermentation source;

ii. extracting said ethanol by countercurrent extraction with diethyl ether to yield an ethanol-diethyl ether mixture;

iii. employing a salting out process which comprises adding anhydrous calcium chloride to said ethanol-diethyl ether mixture to form a diethyl ether layer and an ethanol-calcium chloride solution layer;

iv. removing said $CaCl_2$ from said ethanol-calcium chloride solution by adding sodium carbonate to yield the solids calcium carbonate and sodium chloride; and

v. filtering said ethanol to remove solids of calcium carbonate and sodium chloride and recovering said ethanol as the filtrate.

4,508,930

PROCESS FOR THE CONVERSION OF TERPENES TO LIMONENE

Lawson G. Wideman, Tallmadge, and Lynn A. Bente, Dover, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 20, 1984, Ser. No. 632,746

Int. Cl.³ C07C *5/24, 5/26*

U.S. Cl. 585—377 **16 Claims**

1. A process for the conversion of a terpene to limonene which comprises contacting at least one terpene selected from the group consisting of mono- and bi- cyclic unsaturated hydrocarbons having the formula $C_{10}H_{16}$, with an alkali metal sulfide catalyst on a carrier at a temperature from 300° C. to 450° C.

4,508,931

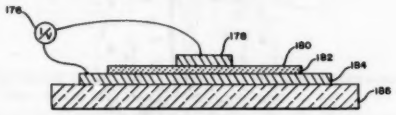
CATENATED PHOSPHORUS MATERIALS, THEIR PREPARATION AND USE, AND SEMICONDUCTOR AND OTHER DEVICES EMPLOYING THEM

Christian G. Michel, Ossining; Rozalie Schachter, New York, both of N.Y.; Mark A. Kuck, Upper Montclair, N.J.; John A. Baumann, Dobbs Ferry, N.Y., and Paul M. Raccah, Chicago, Ill., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 335,706, Dec. 30, 1981, abandoned, and a continuation-in-part of Ser. No. 419,537, Sep. 17, 1982,. This application Nov. 16, 1982, Ser. No. 442,208

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—255 **164 Claims**



37. A method of generating electrical potential between spared electrodes, comprising the steps of:

(a) attaching said electrodes to a material which comprises, at least as one component thereof, a polyphosphide containing phosphorus-to-phosphorus bonds and alkali metal atoms, which atoms are bonded to said phosphorus, and wherein the number of consecutive covalent phosphorus-to-phosphorus bonds is sufficiently greater than the number of non-phosphorus-to-phosphorus bonds, to render said material semiconducting; and

(b) subjecting said material to radiant energy.

4,508,932

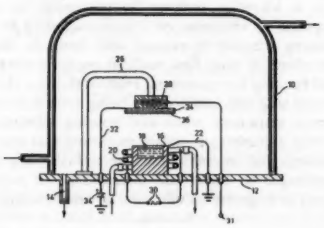
SILICON-BASED SOLAR ENERGY CONVERSION CELLS

Stefan Zukotynski, Thornhill, Canada, assignor to The Innovations Foundation of the University of Toronto, Toronto, Canada

Continuation-in-part of Ser. No. 369,384, Apr. 19, 1982, abandoned. This application Jun. 21, 1984, Ser. No. 623,056

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—258 **20 Claims**



1. A method of making an amorphous silicon-based solar energy conversion device comprising:

placing a substrate to be coated and a source of silicon vapour in an enclosure and establishing a vacuum of a least 1×10^{-4} Torr in the enclosure,

heating the silicon source in the said vacuum to a temperature such as to cause the production of heated silicon vapour within the enclosure, whereby the substrate is exposed in the enclosure under said vacuum to the heated silicon vapour for deposit thereon of a layer of amorphous silicon,

applying an electric field between the source and the substrate with the substrate positive with respect to the source, so that the electric field opposes the deposition of positive silicon ions on the substrate to result in a layer of amorphous silicon having improved electrical characteristics as compared to a layer desposited in the absence of an electric field.

11. A silicon-based solar energy conversion device when prepared by the method of claim 1.

4,508,933

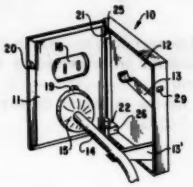
ELECTRIC OUTLET COVER

Thomas Carvel, Chauncey, N.Y., assignor to Carvel Corporation, Yonkers, N.Y.

Filed Mar. 1, 1983, Ser. No. 471,110

Int. Cl.³ H05K *5/03*

U.S. Cl. 174—67 **5 Claims**



1. An electric outlet cover comprising,

a base plate having at least one opening and locking means, said base plate being adapted to be disposed adjacent to an electric outlet so that the outlet registers with said opening for insertion of an electric plug into the outlet through the opening,

a cover plate hingedly connected to said base plate for covering the outlet when the outlet is not used, said cover plate having a closure element adapted to engage said locking means when said cover plate is placed over the base plate, and

at least one supporting means connected to said cover plate and adapted to support an insulated electric conductor when the electric plug connected to the conductor is received in the outlet so that the plug is retained in the outlet despite unintended movement of the wire, said supporting means including an arm, a supporting post connected to an end of the arm, said supporting post being rotationally attached to said cover plate, and a supporting member connected to the opposite end of the arm relative to the supporting post, so that when the cover plate is closed, the arm can be folded inside the cover plate and the arm can be extended relative to the base plate for supporting of the conductor by the supporting member when the plug is inserted into the outlet.

4,508,934

HIGH-CURRENT SWEEP CABLE

Karl T. Feldman, Jr., Albuquerque, N. Mex., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 29, 1983, Ser. No. 537,031

Int. Cl.³ H01B *7/12, 7/34;* **H02G** *15/02*

U.S. Cl. 174—101.5 **18 Claims**

11. A high electrical current conductive marine sweep cable comprising:

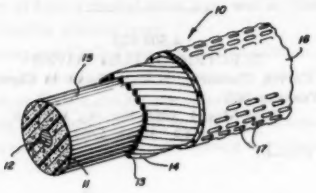
an elongated flotation core defining an outer surface;

longitudinally extending electrical conductors juxtaposed to said surface;

a thin covering of electrical insulation material on each electrical conductor that provides high thermal conductance therethrough;

means for preventing abrasion of said insulation material comprising a porous abrasion-resistant outer jacket surrounding the associated insulated conductors and core, the pore size of said jacket being preselected to conduct

seawater radially therethrough at a rate for effecting sufficient heat transfer between said conductors and the ambient seawater, at a preselected maximum electrical current flow through said conductors, to prevent the I^2R



induced temperature increase in said conductors and insulation material from exceeding a preselected maximum value; and

said cable having an overall density of less than 1.

4,508,935

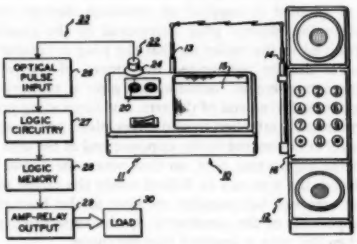
CORDLESS TELEPHONE HAVING A REMOTE CONTROL FUNCTION

John F. Mastromoro, Liverpool, N.Y., assignor to Samuel S. Strobert, Clay, N.Y., a part interest

Filed Jun. 2, 1983, Ser. No. 500,357

Int. Cl.³ H04M *11/00*; H04Q *7/04*

U.S. Cl. 179—2 EA **8 Claims**



1. In a cordless telephone system of the type wherein a base unit is capable of being coupled to existing telephone lines, apparatus for remotely controlling at least one load in response to a coded input signal without interrupting the telephone voice communication, said apparatus including

a remote unit in wireless communication with the base unit, said remote unit having a keyboard for entering digits into the system whereby code numbers representing selected loads can be initiated,

a pulse generator contained in the base unit that is responsive to the keyboard entries for providing a pulsed output signal containing a given number of pulses for each enterable digit whereby each digit is recognizable,

counter means for counting the number of pulses in said output signal from said generator, and providing a coded control signal indicative of a number entered into the keyboard, and

gating means that is enabled in response to the coded control signal to energize a selected load.

4,508,936

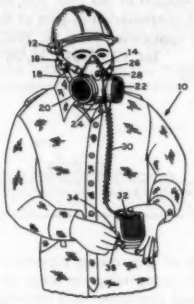
LOCAL EXTERNAL COMMUNICATION SYSTEM

Robert Ingalls, Epping, N.H., assignor to Gentex Corporation, Carbondale, Pa.

Continuation-in-part of Ser. No. 169,419, Jul. 16, 1980, abandoned. This application May 6, 1982, Ser. No. 375,673

Int. Cl.³ H04R *1/08*; H04M *1/05*; A62B *18/00*

U.S. Cl. 179—82 **10 Claims**



1. A combined mask and local external communication system adapted to be applied to said mask as a retrofit including in combination a mask adapted to enclose the mouth of a wearer and having a wall of generally uniform thickness comprising a portion with continuous inner and outer surfaces, an assembly comprising a first coil and a microphone, means for adhering said assembly to the inner surface of said mask wall portion without piercing said wall, means including said microphone for producing a first electrical signal in response to the wearer's voice, means for applying said first electrical signal to said first coil to cause said first coil to produce a magnetic flux passing through said mask, a second coil, means for adhering said second coil to the outer surface of the mask wall portion without piercing said wall and at a location at which it is subjected to the action of said flux to produce a second electrical signal representative of the voice of the wearer without adversely affecting the integrity of the mask, a speaker carried on the person of the wearer, and means for applying said second signal to said speaker.

3. A vibration pick-up for producing an output signal in response to vibration of a body including in combination, a housing adapted to contact said body to receive vibrations therefrom, a slug, first resilient means mounting said slug in said housing for movement relative thereto, the relative masses of said slug and said housing being such that said slug tends to remain stationary when said housing vibrates, a microphone having a diaphragm, means mounting said microphone in said housing, and second resilient means coupling said slug to said diaphragm to cause said microphone to produce an output signal in response to vibration of said housing.

4,508,937

METHOD AND CIRCUITRY FOR ENCODING TELEPHONE RINGING SIGNALS

William A. Burger, Eatontown, N.J.; David M. Embree, Reading, Pa.; Martin H. Singer, Fair Haven, N.J., and David R. Vogelpohl, Indianapolis, Ind., assignors to AT&T Information Systems Inc., Homdel and Bell Telephone Laboratories, Inc., Murray Hill, both of, N.J.

Filed Feb. 28, 1983, Ser. No. 470,149

Int. Cl.³ H04M *1/00*

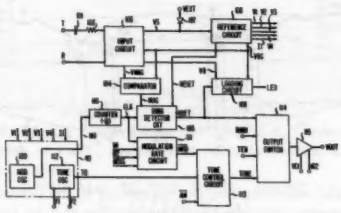
U.S. Cl. 179—84 T **12 Claims**

1. A circuit responsive to a ringing signal received over a communication line for providing a user with encoded telephone ringing signals from a plurality of tones comprising:

ring detector means for detecting the existence of said ring-

ing signal and generating an enable signal during the existence of said ringing signal,

modulating means responsive to said enable signal for generating an encoded ringing signal for the user during the



existence of said enable signal by modulating between at least two of said plurality of tones and

means for controlling the modulation rate of said modulating means at one of a plurality of fixed rates with each rate representing a different code.

4,508,938

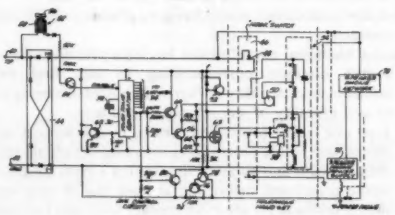
PUSH-BUTTON DIAL FOR A TELEPHONE

Ronald W. Bench, Clay, N.Y., and Edson S. Hineline, Jr., Charlottesville, Va., assignors to Comdial Telephone Systems, Inc., Charlottesville, Va.

Filed May 18, 1983, Ser. No. 495,758

Int. Cl.³ H04M *1/26*

U.S. Cl. 179—90 BD **5 Claims**



1. A solid state touch-tone dial circuit for a telephone, comprising;

a push-button key pad having a plurality of single pole push-button switches, a touch-tone generator connected to the key pad for generating an output signal having a frequency controlled by the closing of respective ones of said push-button switches, the generator providing a control signal output when any of the push-button switches is closed, a hand set including a transmitter, a receiver, and hybrid circuit for connecting the transmitter and receiver to a telephone line, a first transistor switch connected in series with the transmitter, means responsive to said control signal from the touch-tone generator for opening the first transistor switch to disconnect the transmitter while any one of the push-button switches is closed,

a second transistor switch connected across the receiver, and means responsive to the first transistor switch for closing the second transistor switch when the first transistor switch is opened.

4,508,939

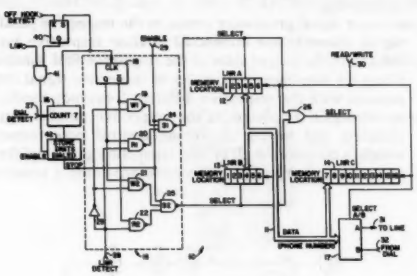
LAST NUMBER REDIAL DEVICE

Robert Lawson; Jimmie R. Augustus; Robert Corless, all of San Jose, and John Kardash, Gilroy, all of Calif., assignors to Comdial Technology Corporation, Sunnyvale, Calif.

Filed Jul. 14, 1983, Ser. No. 513,871

Int. Cl.³ H04M *1/272*

U.S. Cl. 179—90 B **17 Claims**



1. A telephone last number redial device, comprising:

a first register operable to selectably store a first, threshold portion (N) of a telephone number (N+M) produced during a telephone dialing sequence;

a second register operable to alternately store said first, threshold portion (N) of said telephone number (N+M) produced during said telephone dialing sequence;

a third register for storing a second, terminal portion (M) of said telephone number (N+M) produced during said telephone dialing sequence;

select means for alternately coupling a selected one of said first register and said second register to said third register, for storing said first, threshold telephone number portion (N) during said telephone dialing sequence, and for accessing said first, threshold telephone number portion (N) during a last number redial sequence; and

a counter, operable to produce a toggle signal in response to a threshold count (N+1) during said telephone dialing sequence, said threshold count being indicative of a valid phone number entry, said toggle signal being coupled to said select means whereby said selected one of said first register and said second register is coupled to said third register, such that said second, terminal portion (M) of said telephone number, when entered, is concatenated with said first, threshold portion (N) of said telephone number to store said telephone number (N+M) for access during said last number redial sequence.

4,508,940

DEVICE FOR THE COMPENSATION OF HEARING IMPAIRMENTS

Gerhard Steeger, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,413

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131193

Int. Cl.³ H04K *25/00*

U.S. Cl. 179—107 FD **9 Claims**

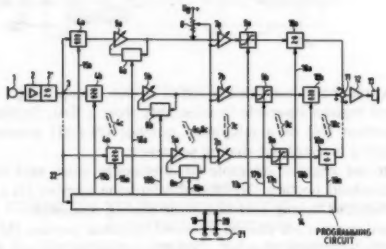
1. A hearing aid device for the compensation of hearing deficiencies, said device comprising a signal input transducer for receiving input audio signals, an input amplifier connected at its input side with the output side of said input transducer, and an output transducer for supplying output signals compensated for a hearing deficiency of a hearing impaired individual,

a plurality of parallel signal channels for transmitting respective signal components of an input signal,

first bandpass filters connected at their input sides with the output side of said input amplifier and connected at their respective output sides with the respective parallel signal channels, said first bandpass filters having respective different frequency responses and supplying to the respective parallel signal channels respective signal components having respective different frequency bands of an input signal, and said first bandpass filters each being a sampled-data analog filter and being realized in integrated circuit technology,

non-linear signal processing means in the respective parallel signal channels and connected at their respective input sides with the output sides of the respective first bandpass filters for non-linear processing of respective signal components with the respective different frequency bands,

controlled-gain amplifiers in the respective parallel signal channels and having a volume control potentiometer which is common to all of said controlled gain amplifiers, said volume control potentiometer providing a common



adjustment of the gain for all of said parallel signal channels,

second bandpass filters in each of said parallel signal channels and connected at their input sides with the output sides of the respective non-linear signal processing means in the respective parallel signal channels, said second bandpass filters each being a sampled-data analog filter and being realized in integrated circuit technology, and said second bandpass filters having respective frequency responses substantially corresponding with the frequency responses of said first bandpass filters for reducing distortion components caused by the respective nonlinear signal processing means, and

signal summing and amplifier means connected at its input side with the output sides of all of said second bandpass filters and connected at its output side with the input side of said output transducer for combining signal components from all of the second bandpass filters into a resultant signal and for supplying an amplified resultant signal to said output transducer.

4,508,941

VOICE COIL CENTERING AND SUSPENSION FOR VENTED POLE PIECE

John T. Wiggins, Philadelphia, Pa., assignor to Community Light & Sound Inc., Chester, Pa.

Filed Oct. 28, 1982, Ser. No. 437,258

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147145

Int. Cl.³ H04M *2/02*

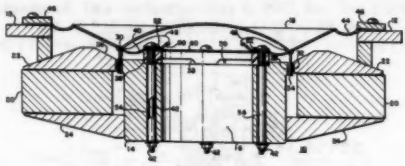
U.S. Cl. 179—115.5 PC **23 Claims**

1. A self-centering mounting arrangement for a diaphragm and voice coil assembly in a magnetic structure having an axially vented pole piece which defines an inner boundary for an air gap in the magnetic structure, in which air gap the voice coil must be aligned, the arrangement comprising:

a mounting ring;

a voice coil suspension for the diaphragm and voice coil assembly projecting outwardly from the mounting ring and in axial alignment therewith; and,

the pole piece having a concentric recess of predetermined diameter formed in the top thereof and the outer diameter



of the mounting ring corresponding to the predetermined diameter, whereby the mounting ring may be received in the recess and positively held in axial alignment with the pole piece, the voice coil being thereby automatically properly positioned in the air gap.

4,508,942

KEYBOARD SWITCH

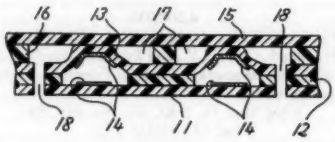
Masaichi Inaba, Ibaraki, Japan, assignor to Nippon Mektron Ltd., Japan

Filed Nov. 28, 1983, Ser. No. 555,819

Claims priority, application Japan, Nov. 30, 1982, 57-211126

Int. Cl.³ H01H *13/76*

U.S. Cl. 200—5 A **10 Claims**



1. A membrane keyboard including:

first electrical circuit means having a plurality of first switch contacts;

second electrical circuit means having a plurality of second switch contacts corresponding to said first switch contaets, said plurality of first switch contacts being equal to said plurality of second switch contacts;

at least one tactile protrusion formed in said second circuit means, said tactile protrusion projecting out of said second circuit means and away from said first circuit means, said tactile protrusion supporting at least one of said second switch contacts for selective contact with said first switch contacts;

insulating means between said first and second circuit means, said insulating means having at least one opening aligned with said protrusion to permit selective contact between said first and second switch contacts, said opening being hermetically sealed from the ambient environment;

flexible cover sheet means planar with the upper surface of said protrusion, said cover sheet enclosing said second electrical circuit means;

spacer means between said flexible cover sheet means and said second circuit means, said spacer means having at least one cavity surrounding said protrusion; and

channel means connecting said spacer means cavity with said ambient environment, said channel means being located through at least said first and second electrical circuit means and said insulating means.

5. A keyboard as in claim 1 wherein:

at least a portion of said first electrical circuit means, said second electrical circuit means and said insulating means are in abutting relationship; and wherein:

said channel means is located through said abutting portion

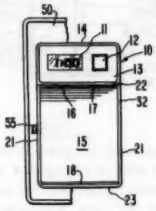
of said first and second electrical circuit means and said insulating means.

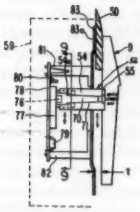
4,508,943

WALL COMMAND SWITCH

James W. Pfeiffer, Santa Clara, and Thomas E. Corder, Martinez, both of Calif., assignors to Security Switch, Ltd., San Ramon, Calif.

Filed Mar. 28, 1983, Ser. No. 479,382
Int. Cl.³ H01H *3/00*
U.S. Cl. 200—17 R **19 Claims**





9. A wall command lighting switch comprising

(a) a base portion mechanically connected to one side of a mounting plate of an electrical wall switch box and positioned exteriorly of said switch box;

(b) a movable pressure plate at least partially mounted within said base portion;

(c) means for mounting a first electrical switch adjacent to and under a bottom surface of said base portion;

(d) first switch operator means connected to said plate and in alignment with operable portions of said first switch means whereby movement of said plate moves said first switch operator means into and out of operative engagement with said first switch means;

(e) a second switch operator means connected in sliding relationship to said base portion;

(f) a second electrical slide switch connected in spaced relation to the opposite side of said mounting plate and positioned internally of said switch box; and

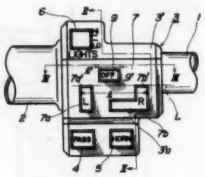
(g) means integrally extending from said second switch operator means and behind said base portion for connecting said second switch operator means to said second slide switch, said second electrical slide switch being movable into automatic or manual or off positions to automatically control lighting functions and wherein said first switch means is operable by movement of said plate in any position of said second slide switch.

4,508,944

HANDLE SWITCH ASSEMBLY FOR MOTORCYCLES

Michio Yashima, Kawagoe; Akihiro Komatsu, Nerima; Masami Takanashi, Yokohama; Masashi Hirose, Wako, and Kengo Nakayama, Iruma, all of Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 481,635
Claims priority, application Japan, Apr. 5, 1982, 57-49175[U]; Apr. 5, 1982, 57-49176[U]; Apr. 5, 1982, 57-49177[U]; Apr. 5, 1982, 57-49178[U]; Apr. 5, 1982, 57-49179[U]; May 31, 1982, 57-80358[U]
Int. Cl.³ H01H *9/06*
U.S. Cl. 200—61.85 **9 Claims**



1. A handle switch assembly for use in a motorcycle in combination with a pair of handle grips mounted on opposite ends of a steering handle, said handle switch assembly comprising:

a housing arranged around said steering handle in the vicinity of one of said handle grips and having one surface extending transversely and generally contoured circumferentially of said one of said handle grips; and

a plurality of switches arranged in said housing, at least one of said switches including a plurality of push buttons arranged on said one surface of said housing,

said push buttons being juxtaposed on said one surface of said housing along a line extending axially of said one of said handle grips, with each of said push buttons having a side face facing in the same predetermined circumferential direction of said one of said handle grips, and a plurality of push rods integrally connected to respective ones of said push buttons,

said push rods each having an axis thereof extending in a direction in which a corresponding one of said push buttons may be pushed,

said push buttons each having a pushing surface adjacent said one surface of said housing,

at least a part of each push button remote from said one of said handle grips having the pushing surface thereof offset toward said one of said handle grips with respect to the axis of the corresponding integrally connected push rod,

said push buttons each having a portion thereof outwardly projected from said one surface of said housing, the projected portion of each push button having a volume greater than that of any of said push buttons closer to said one of said handle grips.

4,508,945

VACUUM SWITCHING INTERRUPTER WITH ANNULAR MEMBER AND DIAMETRICAL CONTACT WEB

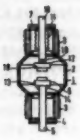
Karl Zückler, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

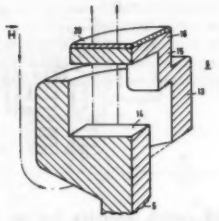
Filed Sep. 19, 1983, Ser. No. 533,735
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1982, 3235298
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **3 Claims**

1. A vacuum switching arrangement of the type having two contacts which are movable with respect to one another, each contact having an annular member and a diametrical web for

connecting the annular member to a lead-in pin, the contact further comprising:

a contact plate in the form of a cylindrical washer, said contact plate being made slotless and having a diameter smaller than the annular member; and





a pair of projections arranged as arms for mechanically and electrically coupling said contact plate and the annular member to one another.

4,508,946

MICROWAVE OVEN WITH ROTARY ANTENNA

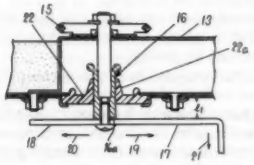
Hirofumi Yoshimura, and Nobuo Ikeda, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 8, 1983, Ser. No. 473,343

Claims priority, application Japan, Mar. 11, 1982, 57-38441; Mar. 12, 1982, 57-39806

Int. Cl.³ H05B *6/64*

U.S. Cl. 219—10.55 F **3 Claims**



1. A high-frequency heating apparatus comprising:

a heating chamber for accommodating a heating load;

a high frequency oscillator for generating high frequency electromagnetic waves;

a waveguide extending from said oscillator for propagating said high frequency electromagnetic waves; and

a rotary antenna between said waveguide and the interior of said heating chamber for feeding said electromagnetic waves into said heating chamber, said rotary antenna having a rotary shaft extending from said waveguide into said heating chamber, a first antenna portion and a second antenna portion mounted on the end of said shaft in said heating chamber and extending at substantially right angles to said shaft in opposite directions therefrom, said first antenna portion having a greater length than said second antenna portion by approximately one quarter of the wavelength of said high frequency electromagnetic waves, and the free end of said first antenna portion being bent about 90 degrees to the first antenna portion in a direction toward the central part of the interior of said chamber and the thus bent portion having a length not exceeding one quarter of the wavelength of said electromagnetic waves.

4,508,947

MICROWAVE OVENS AND METHODS OF COOKING FOODS

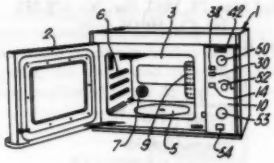
Kenneth I. Eke, Sanderstead, England, assignor to Microwave Owens Limited, Surrey, England

Filed Jul. 13, 1983, Ser. No. 513,296

Claims priority, application United Kingdom, Jul. 17, 1982, 8220786; Oct. 20, 1982, 8230015; Nov. 19, 1982, 8233098

Int. Cl.³ H05B *6/06, 6/78*

U.S. Cl. 219—10.55 B **17 Claims**



1. A portable microwave oven designed to be powered from a domestic power socket with a rating not exceeding 1800 watts, comprising a microwave generator for supplying microwave power to a cavity of the oven, a rotatable turntable on the base of said cavity for supporting and rotating food therein, thermal heating means capable of heating the air within the oven cavity, and control means operative to supply continuous microwave power to said cavity simultaneously with the supply of thermal power to said cavity, whereby the microwave power heats the inside of the food rotated by said turntable and the thermal power dissipates the resulting moisture and browns the external surface of the food rotated by said turntable, said thermal heating means comprising an electrical heating element and fan means for recirculating air over said element and through said cavity, said fan means causing a forced flow of air, heated by said thermal heating means, to enter said cavity from one side thereof, to pass around and over food on said turntable in a direction opposite to its direction of rotation and thereafter to leave said cavity from the other side thereof.

4,508,948

MICROWAVE COOKING METHOD

Roger W. Carlson, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed Jan. 16, 1984, Ser. No. 571,159

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 M **8 Claims**

1. In a microcomputer controlled microwave oven having a scale coupled to the cavity thereof, the method of using the microcomputer to control the microwave oven comprising the steps of:

positioning a food body in said cavity of said microwave oven;

providing a first signal from said scale to said microcomputer, said first signal corresponding to the weight W of said food body positioned in said cavity;

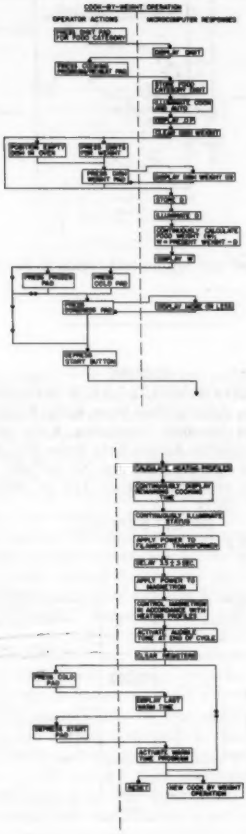
inputting a second signal to said microcomputer, said second signal specifying the food category of said food body as selected by the operator;

calculating a first time period in response to said first signal, said first time period defining the time of microwave radiation to raise the temperature of said food body from an initial state of approximately refrigerator temperature to a final state of approximately room temperature;

calculating a second time period in response to said first and second signals, said second time period defining the time

of microwave radiation to cook said food body from an initial state of approximately room temperature;

controlling said microwave oven through sequential steps of microwave radiation in accordance with said first and second time periods, respectively; and



controlling said microwave oven through a sequential step of microwave radiation in accordance with said first time period of a second occurrence, said second occurrence following said step of said second time period and being in response to an operator actuated input.

4,508,949

METHOD AND APPARATUS FOR WELDING TAPERED METAL POLES

Wallace C. Rudd, New Canaan, Conn., assignor to Thermatool Corporation, Stamford, Conn.

Filed Sep. 30, 1982, Ser. No. 429,099

Int. Cl.³ B23K *11/32*

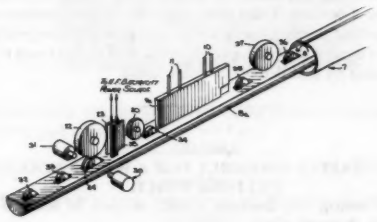
U.S. Cl. 219—61.2 **17 Claims**

15. A method for manufacturing a tapered metal tube, said method comprising:

forming a substantially complete tube from a sheet of metal, said tube having portions adjacent to the edges of said sheet adjacent to but spaced from each other with surfaces thereof facing each other and said tube having a cross-section which varies in size in the direction of its length;

advancing said tube lengthwise thereof to bring said portions to a weld point with said surfaces thereof in spaced apart relation in advance of said weld point;

guiding said portions to the weld point by supporting said tube at said weld point by means engaging the interior of said tube at or adjacent said portions while permitting a part of said tube opposite from said portions to assume positions determined by the positions of said portions;



in advance of said weld point, supplying high frequency, electrical heating current to said tube by contacts to bring at least said surfaces of said portions to welding temperature by the time they reach the weld point, one of said contacts engaging said tube at or adjacent one of said portions and the other of said contacts engaging said tube at or adjacent the other of said portions; and

bringing said portions into contact and welding them together by pressing said surfaces of said portions together at said weld point by applying pressure to the oppositely facing surfaces of said portions which is directed transversely to said surfaces.

4,508,950

EDM METHOD AND APPARATUS USING LIQUID HYDROCARBON DECOMPOSITION YIELDED GASES AND A DEIONIZED WATER LIQUID

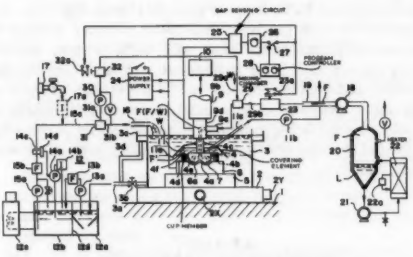
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Mar. 10, 1983, Ser. No. 474,745

Claims priority, application Japan, Mar. 25, 1982, 57-48441

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 D **30 Claims**



21. An apparatus for machining an electrically conductive workpiece by means of a succession of discrete, time-spaced electrical discharges effected between a tool electrode and the workpiece across a machining gap so as to electroerosively remove material from the workpiece, the apparatus comprising:

means for immersing at least a region of a tool electrode juxtaposed with a conductive workpiece across a machining gap across which a succession of discrete, time-spaced

electrical discharges are effected, which region defines said machining gap in a continuous volume of a deionized water liquid of a temperature sufficient to cool at least said region against heat to be developed by said electrical discharge, said electrical discharges effecting electroerosive material removal from said workpiece;

means for decomposing, outside of said machining gap, a liquid hydrocarbon to yield gases containous gaseous hydrocarbons; and

means for injecting a volume of said yielded gases into said machining gap immersed in said water liquid whereby at least a portion of said gases injected volume constitutes a gap fluid medium for said electrical discharges to produce said erosive material removal while said region tends to be cooled by said deionized water liquid.

4,508,951

FLUID BAFFLE ASSEMBLY FOR A WATER-COOLED WELDING TORCH

William Rehrig, Jr., Burbank, Calif., assignor to Richard B. Rehrig, Burbank, Calif.

Filed Aug. 19, 1982, Ser. No. 409,663
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—74 **4 Claims**

3. In a water-cooled welding and cutting torch of the type having an inner cylindrical wall and outer cylindrical wall defining an annular chamber therebetween for the ingress and egress of water therethrough, the improvement comprising: a baffle member defining an arcuate elongate body portion and a pair of lateral flanges extending along the length thereof and projecting radially therefrom and a pair of diametrically opposed grooves in the interior of said outer cylindrical wall, the spacing between said grooves being less than the transverse dimension of said baffle member such that upon disposing said flanges within said grooves, said baffle member is held in compression therebetween with said body portion thereof bearing against said inner cylindrical wall and said flanges separating said annular chamber into a water inlet channel, a water outlet channel and an annular lower cooling chamber, said inlet channel being separated from said outlet channel by said flanges and said channels communicating with said lower cooling chamber.

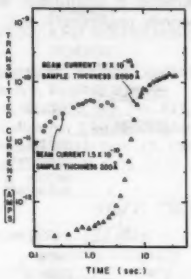
4,508,952

ELECTRON BEAM CUTTING

Margaret E. Mochel, Champaign, Ill., and Colin J. Humphreys, Abingdon, England, assignors to University Patents, Inc., Westport, Conn.

Filed Feb. 17, 1983, Ser. No. 467,559
Int. Cl.³ B23K *15/00*
U.S. Cl. 219—121 EH **3 Claims**

1. A method for providing an opening through a positive ionic conductor material having minimal electron conduction which comprises (a) placing said material in a vacuum, and (b) exposing a region of said material to a focused electron beam having a current level sufficient to cause the material within said region to become positively charged, and causing the



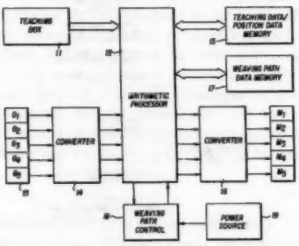
positively charged ions within said region to be repelled from said region.

4,508,953

METHOD OF MULTI-LAYER WELDING

Tsudoi Murakami, Ashiya; Shoji Nasu, Kobe; Kazuaki Tatsumi, Kamakura, and Yasuhide Nagahama, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 22, 1983, Ser. No. 487,687
Claims priority, application Japan, Apr. 27, 1982, 57-71791; Apr. 30, 1982, 57-73679
Int. Cl.³ B23K *9/12*
U.S. Cl. 219—125.1 **11 Claims**



1. A method of multi-layer welding in which the welding operation is performed according to a path of welding defined by interpolating a suitable line between a plurality of instruction points and which utilizes a welding torch, a memory device and an arithmetic processor, wherein said method comprises:

storing in said memory device coordinates of a plurality of instruction points that define a desired path for a first welding layer;

welding said first layer by interpolating a suitable path between said plurality of instructed points;

detecting coordinates of points actually passed during said welding of said first welding layer;

storing in said memory device said detected coordinates as teaching points for second and succeeding welding layers; and

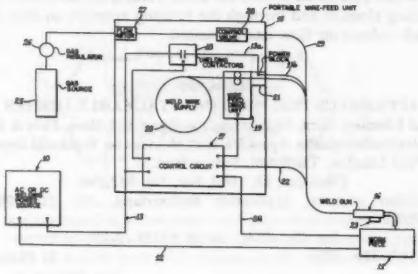
determining welding paths of said second and succeeding layers by adding a predetermined amount of shift to said actually detected coordinates stored in said memory device at said teaching points and interpolating a suitable line between the shifted coordinates by means of said arithmetic processor.

4,508,954

PORTABLE ARC VOLTAGE WIREFEED WELDING SYSTEM

Robert E. Kroll, Orland Park, Ill., assignor to Oxo Welding Equipment Co., Inc., New Lenox, Ill.

Filed May 18, 1984, Ser. No. 612,043
Int. Cl.[3] B23K 9/10
U.S. Cl. 219—132 6 Claims



1. In a consumable wire electrode arc welding system having a welding power source, a portable wirefeed unit and a remote welding gun with a normally open trigger switch, a single electrode power cable interconnecting the power source to the wirefeed unit and to said gun, a ground cable interconnecting the power source and a work piece to be welded, and control cables interconnecting the wirefeed unit with said trigger switch and welding ground potential, improved wirefeed and welding control apparatus comprising: rectifier means coupled to the electrode power cable for energization by either AC or DC power carried thereby and productive of a low voltage DC output, capacitor means in circuit with the output of said rectifier means, voltage regulator means in circuit with said capacitor means and the output of said rectifier means for providing low voltage power to load components comprising control relay means and welding contactor control means; wirefeed drive motor means in circuit with the output of said rectifier means and operable to feed electrode wire to the welding gun, and welding contactors in circuit with the electrode power cable and welding gun and operable to control energization of the welding wire electrode; said capacitor means serving to reinforce the output of said voltage regulator means to maintain said control relay means and welding contactor control means energized during low voltage dips, such as at welding arc initiation; energization of said control relay means and welding contactor control means being selectively controlled by the welding gun trigger switch.

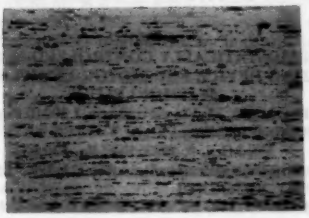
4,508,955

ELECTRODE FOR THE TIG WELDING PROCESS

Michael Müller, Munich, and Dietmar Mautner, Herbertshausen, both of Fed. Rep. of Germany, assignors to Mortoren Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,732
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1983, 3309069
Int. Cl.[3] B23K 35/00
U.S. Cl. 219—146.21 3 Claims

1. An electrode for a TIG welding process, in which a welding arc is produced by contact-less ignition between a tip of the electrode and the workpiece within an atmosphere of an inert gas and welding material is supplied from a separately guided welding rod, said electrode consisting of tungsten with



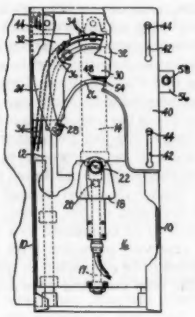
thorium-oxide, the thorium oxide being present in an amount of 2–4% and a particle size of 6–12 μm.

4,508,956

HEAT DEVICE FOR HEATING PORTIONS OF SHOE UPPERS

Arthur W. Prichard, Leicester, England, assignor to USM Corporation, Farmington, Conn.

Filed Aug. 30, 1982, Ser. No. 412,994
Claims priority, application United Kingdom, Sep. 12, 1981, 8127602
Int. Cl.[3] A43D 25/20; H05B 1/02
U.S. Cl. 219—215 3 Claims



1. A heater device for heating portions of shoe uppers in a shoe upper backpart molding machine, prior to molding such portions to a desired shape, the device comprising:

a shaped inner form;

a co-operating outer band of a flexible silicone rubber sheet material;

means for effecting relative movement between the inner form and the outer band, whereby a shoe upper placed therebetween can be clamped between the inner form and the outer band, the latter stretching about the inner form to cause the upper to be conformed to the shape thereof and thus causing the shoe upper to be pressed over its area against the inner form;

first and second heating means for heating respectively the inner forms and the outer band, the second heating means comprising radiant heater means to which the outer surface of the band is exposed; and

temperature control means for controlling the operation of the second heating means, said temperature control means comprising a temperature sensing element and a controller operable in response to signals from said element to control the second heating means, wherein the temperature sensing element is carried in a tubular pocket of flexible silicone rubber material being secured by adhesive, with a line contact, onto the outer surface of the outer band, with

its longitudinal axis of the tubular pocket perpendicular to the direction of stretch of the outer band to insure securement thereto and provide temperature control thereof, even with any stretching of said outer band.

4,508,957

THERMOSTATICALLY CONTROLLED ELECTRIC HEATING DEVICE FOR MOTOR VEHICLE GLASS WASHING FLUID

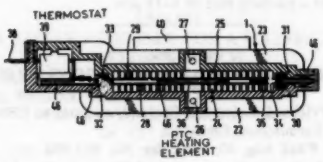
Onofrio Rocchitelli, 31, Via per Lainate, I 20010 Pogliano Milanese, Province of Milano, Italy

Filed Sep. 9, 1983, Ser. No. 530,534

Claims priority, application Italy, Sep. 24, 1982, 23017/82[U]; Mar. 2, 1983, 20986/83[U]

Int. Cl.³ B60S *1/46*; B67D *5/62*; H05B *1/02*; F24H *1/10*

U.S. Cl. 219—305 **10 Claims**



1. Heating device for the glass washing fluid of motor vehicles and the like, consisting of at least one plate-like body element in which a spiral channel is made, said channel having two communications with the outside, namely an inlet and an outlet, said channel being sealingly closed by a plate cover, a heating element being externally superposed to said plate in heat exchange relation to heat the fluid to a desired temperature and consisting of a PTC (Positive Temperature Coefficient) thermistor, and adapted to be connected through a suitable switch to the two poles of the motor vehicle battery, a thermostat connected in series with the thermistor and arranged on the plate cover so as to be responsive to the temperature thereof, wherein the thermistor is calibrated to reach a temperature substantially higher than said desired temperature and said thermostat is activated at the desired temperature, the channel inlet adapted to be connected to a line coming from the washing fluid reservoir provided with a pump, and the channel outlet adapted to be connected to spraying nozzles, so that water enters the inlet cold and goes out warm from the outlet.

4,508,958

CEILING FAN WITH HEATING APPARATUS

Frederick S. C. Kan; Kam Wing Li, and Kong Ping P. Lau, all of Kowloon, Hong Kong, assignors to Wing Tat Electric Mfg. Co. Ltd., Kowloon, Hong Kong

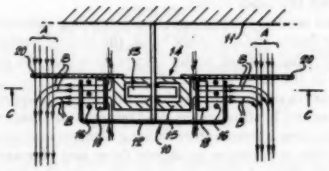
Filed Dec. 16, 1982, Ser. No. 450,169

Continuation-in-part of Ser. No. 424,789, Sep. 27, 1982.

Claims priority, application United Kingdom, Nov. 1, 1982, 8231200

Int. Cl.³ F24H *3/04*; H05B *1/00*

U.S. Cl. 219—369 **14 Claims**



1. A ceiling fan for optionally heating or cooling a room comprising a housing adapted to be suspended from a ceiling and including an aperture arranged so that air can flow through the housing; a motor disposed within the housing and having a stationary stator and a rotatable rotor; a selectively energizable electric heating element disposed within the housing and spaced from the motor; first fan means attached to the rotor and disposed exteriorly of the housing for generating a relatively large volume air flow on the exterior of the housing; and second fan means for generating a relatively small volume flow and positioned to pass the small volume air flow over the heating element and through the housing aperture so that the small volume air flow can be heated.

4,508,959

APPARATUS FOR HEATING STACKABLE DISHES

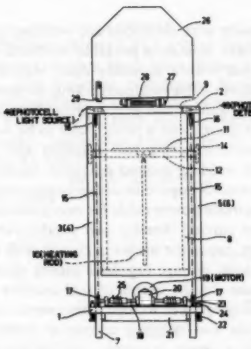
Paul Lüscher, Bern, Switzerland, assignor to Lükon, Fabrik für elektrothermische Apparate und elektrische Stabheizkörper, Paul Lüscher, Täuffelen, Switzerland

Filed Jul. 12, 1983, Ser. No. 513,096

Claims priority, application Switzerland, Jul. 21, 1982, 4439/82

Int. Cl.³ F24C *15/18*; F27D *11/02*

U.S. Cl. 219—385 **11 Claims**



1. An apparatus for heating stackable dishes, comprising a heatable housing with an open top, a cover for closing the open top, a support for a stack of dishes, the support being arranged in said housing and being adapted to be raised and lowered, power-driven means for selectively raising and lowering said support, the power-driven means for raising and lowering the support comprising drive means which is electrically controllable for lowering the support, a first switch being included in a circuit for the drive means, said switch being controlled by a sensing arrangement arranged at an upper edge of the housing, whereby when a top of a stack of dishes resting on the support passes down through said upper edge said first switch is opened, and a second switch in the circuit for the drive means, time delay means, the second switch being closed after a predetermined time interval by the time delay means, the time delay means being actuated by a manually operable switch which controls the raising and lowering of the support.

4,508,960

LIGHT-RADIANT FURNACE

Tetsuji Arai, Tachikawa, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,474

Claims priority, application Japan, Aug. 30, 1982, 57-149055

Int. Cl.³ F27B *9/06*; H05B *1/02*

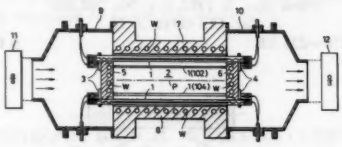
U.S. Cl. 219—388 **1 Claim**

1. A method for heating semiconductor wafers by a light-radiant furnace equipped with, as the light-radiant source thereof, incandescent lamps having filaments subject to burn-

ing out as a result of a rush current substantially greater than a current of a full-radiation-state operation of said incandescent lamps, said method comprising:

transporting a plurality of said semiconductor wafers successively into the light-radiant furnace;

controlling operation of the incandescent lamps so that the incandescent lamps are brought into heating operation in synchronization with the transportation of each of said semiconductor wafers into the light-radiant furnace and



are operated in accordance with a predetermined heating operation curve including said full-radiation-state operation to expose each said semiconductor wafer to light for its heating; and

limiting the flow of said rush current through the incandescent lamps by feeding a small current to said lamps so as to provide dim operation of said lamps prior to each said heating operation of the incandescent lamps in accordance with the heating operation curve.

4,508,961

ELECTRIC RADIANT HEATER UNITS FOR GLASS CERAMIC TOP COOKERS

Joseph A. McWilliams, Droitwich, England, assignor to Micropore International Limited, Droitwich, England

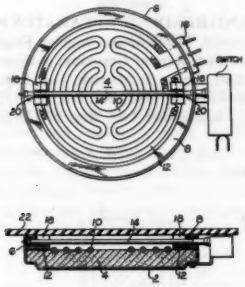
Filed Feb. 28, 1983, Ser. No. 470,294

Claims priority, application United Kingdom, Mar. 2, 1982, 8206043

The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—449 **11 Claims**



1. An electric radiant heater unit for a glass ceramic top cooker, the heater unit comprising:

a base layer of electrical and thermal insulating material;

first and second bare heater elements disposed adjacent to each other on the base layer, said second heater element being disposed peripherally about said first heater element, said first and second heater elements being arranged such that, in use, heat emitted by the second heater element augments heat emitted by the first heater element;

a peripheral wall of thermal insulating material positioned on the base layer and surrounding the heater elements for keeping heat within the peripheral wall;

a thermal cut-out device for controllably disconnecting an electrical power source from the heater elements, the thermal cut-out device extending over the first and second heater elements; and

means for minimizing heat conduction to the thermal cut-out device in regions thereof which pass over the second heater element from heat emitted by both the first and second heater elements.

4,508,962

READ FORMAT PRESET IN AN ELECTRONIC CASH REGISTER

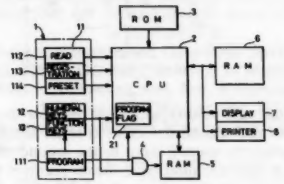
Hitoshi Yamasaki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 285,638, Jul. 21, 1981, abandoned. This application Jul. 9, 1984, Ser. No. 629,732

Claims priority, application Japan, Jul. 30, 1980, 55-105737

Int. Cl.³ G06K *15/00*

U.S. Cl. 235—378 **6 Claims**



1. An electronic cash register comprising:

transaction data memory means for storing transaction data;

mode selection means for selectively placing the electronic cash register in a normal registration mode, a read out mode or a program preset mode;

keyboard panel means for introducing transaction data into said transaction data memory means in said normal registration mode, and for introducing program commands into the electronic cash register in said program preset mode, said program commands including variable print format instruction commands for determining a print format of the information printed out in said read out mode;

print format memory means for storing said variable print format instruction commands introduced from said keyboard panel means in said program present mode;

read out means responsive to said print format memory means for reading out said transaction data stored in said transaction data memory means in accordance with said variable print format instruction commands stored in said print format memory means when the electronic cash register is placed in said read out mode; and

printer means for printing out said transaction data read through said read out means in said read out mode.

4,508,963

DETECTOR MISMATCH CORRECTION APPARATUS

Dennis J. Wilwerding, Littleton, and James R. Adams, Jr., Westminster, both of Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 28, 1982, Ser. No. 425,341

Int. Cl.³ G01J *1/20*

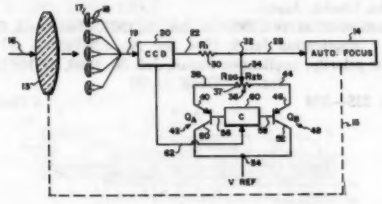
U.S. Cl. 250—201 **10 Claims**

1. Apparatus for use with a system in which a plurality of first detectors and a plurality of second detectors are exposed to variable conditions and each detector is operable to produce a signal of magnitude indicative of the condition to which it is exposed, the apparatus being operable to at least partly correct for a mismatch of detectors that causes the magnitude of the signals from the first detectors to differ from the magnitude of the signals from the second detectors when they are exposed to the same condition, the signals from the first detectors and the

signals from the second detectors being presented in serial fashion at a first output of the system and a first control signal being presented at a second output of the system each time a signal from a first detector is presented at the first output, comprising:

modifying means having first and second inputs and an output, said modifying means operable upon receipt of a control signal at the second input to modify any signal at the first input to produce a modified signal at the output of said modifying means;

means connecting the first input to the first output of the



system so that said modifying means receives the signals from the first and second detectors in serial fashion; and

means connecting the second input to the second output of the system so that said modifying means receives the first control signal each time a signal from a first detector appears at the first input, said modifying means modifying all of the signals from the first detectors by a first value and all of the signals from the second detectors by a second value which causes the modified signals at the output of said modifying means to have substantially the same magnitude when the first and second detectors are exposed to the same condition.

4,508,964

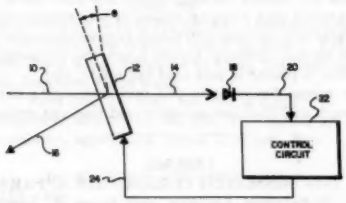
ELECTRO-OPTICALLY TUNED REJECTION FILTER

William J. Gunning, III, Newbury Park, and John M. Tracy, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 29, 1982, Ser. No. 426,348

Int. Cl.³ G02F 1/03

U.S. Cl. 250—201 **9 Claims**



1. An apparatus for automatically removing intense, narrowband electromagnetic energy centered at an unknown wavelength λ from a broadband beam of electromagnetic energy, comprising:

an electro-optically tunable interference filter for intercepting the beam, the transmission of said filter being controllable by the application of an electrical potential to said filter;

a detector for producing an electrical signal in response to the electromagnetic energy transmitted by said filter; and

a control circuit for calculating the partial derivative of said signal with respect to said applied potential and adjusting the applied potential to minimize the absolute value of said partial derivative and thereby maximize the transmission of electromagnetic energy at the wavelength λ by the filter.

4,508,965

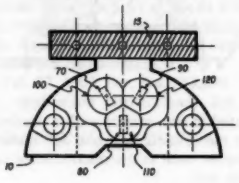
UNIAXIALLY COLLIMATED LIGHT SOURCE FOR OPTICAL SHAFT ANGLE ENCODERS

James R. Casciani, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 5, 1982, Ser. No. 355,002

Int. Cl.³ G01D 5/34

U.S. Cl. 250—231 SE **9 Claims**



1. A optical shaft angle encoder for generating an electrical signal in response to rotation of a shaft, comprising:

light emitting means for generating a uniaxially collimated beam, the light emitting means having a length dimension greater than a width dimension thereof;

a code wheel, concentrically, affixed to the shaft and positioned to receive the beam from the light emitting means and to modulate the beam, said wheel having a plurality of radially positioned transmissive slits therethrough;

detector means, positioned to receive the modulated beam from the encoder means, for generating the electrical signal indicative of rotation of the shaft; and

wherein the length dimension of the light emitting means is located on and aligned with a radius of the shaft and the width dimension is orthogonal thereto and is substantially parallel to the code wheel.

4,508,966

RECORDING AND READOUT APPARATUS FOR X-RAYS

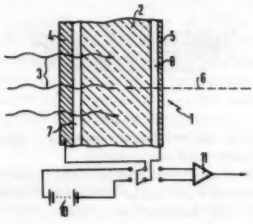
Raimund Oberschmid, Munich, and Ingmar Feigt, Langensendelbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 18, 1983, Ser. No. 524,437

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3235076

Int. Cl.³ G03C 5/16

U.S. Cl. 250—327.2 **7 Claims**



1. A recording and readout apparatus for X-rays, comprising: a layer means comprising a $Bismuth_{12}$ Oxide compound in which, given an applied external electric field in association with the layer means, by use of incident X-rays, an electric charge distribution corresponding to a respective X-ray image

is generated and stored in the layer means; a light ray generating and scanning means for a point-by-point readout of the stored charge distribution by scanning the layer means in a point-by-point fashion; said layer means having generated therein electric photoconduction by exposure to said light ray; and opposite surfaces of the layer means each being covered with an electrode, at least one of the electrodes being electrically insulated by an insulating layer from the layer means; and means for connecting said electrodes during readout operations to a current-amplifier with low input-impedance and during recording to an electric field source.

4,508,967

ELECTRONIC OPTICAL APPARATUS COMPRISING PYROLYTIC GRAPHITE ELEMENTS

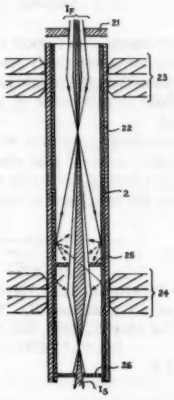
Pierre Boissel, and Mathias Tong, both of Courbevoie, France, assignors to Cameca, Courbevoie, France

Filed Jan. 11, 1983, Ser. No. 457,233

Claims priority, application France, Jan. 22, 1982, 82 01010

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—396 R **6 Claims**



1. In an electronic optical apparatus comprising an electron gun, a condenser block for the electron beam coming from the gun, a deflection and focussing block for the beam coming from the condenser block and a useful signal detection device, the tubular screen surrounding the beam inside the condenser block and the deflection block are formed from a vacuum tight outer part and an inner part formed from pyrolytic graphite.

4,508,968

APPARATUS FOR PROCESSING NEGATIVE PHOTORESIST

Koichi Kobayashi, Yokohama; Kenichi Kawashima, Sagamihara, and Shuzo Oshio, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

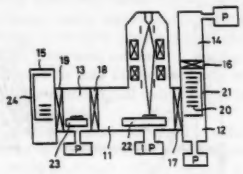
Division of Ser. No. 329,941, Dec. 11, 1981, Pat. No. 4,426,439. This application Jul. 5, 1983, Ser. No. 510,584

Claims priority, application Japan, Dec. 12, 1980, 55-175634

Int. Cl.³ G01N *23/00, 21/00*

U.S. Cl. 250—441.1 **6 Claims**

1. An exposure apparatus comprising: a gas chamber filled with non-oxidizing gas and an exposure chamber connected to the gas chamber wherein charged particle beams are irradiated onto a substrate for pattern writing exposure, in which after exposure in said exposure chamber, said substrate is kept in



non-oxidizing gas in said gas chamber and then taken out to the outside atmosphere.

4,508,969

DEVICE FOR HOLDING, TRANSPORTING AND FINAL STORING OF BURNED-OUT REACTOR FUEL ELEMENTS

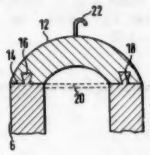
Klaus Janberg, Ratingen, and Hans-Peter Dyck, Burgdorf, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung, Fed. Rep. of Germany

Filed Jun. 25, 1981, Ser. No. 277,348

Claims priority, application European Pat. Off., Jun. 28, 1980, 80103681.5

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—506.1 **7 Claims**



2. A device for holding, transporting and finally storing burned out reactor fuel elements comprising an open-ended cylindrical container having a sealing surface around said open end, a cover for said open end having a sealing surface for mating with said container sealing surface, characterized in that

one sealing surface has an annular undercut recess, said recess being enlarged below said surface, the other sealing surface has an integral annular projection of a shape complementary to said undercut recess, said projection being disposed in said recess.

4,508,970

MELT LEVEL SENSING SYSTEM AND METHOD

Charles B. Ackerman, Paradise Valley, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 15, 1982, Ser. No. 398,495

Int. Cl.³ G01N *21/26*

U.S. Cl. 250—577 **17 Claims**

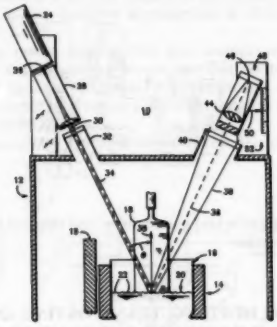
1. A sensing system for detecting changes in the level of a liquid surface comprising:

a source of essentially monochromatic illumination of narrow beam width for directing an incident beam toward said liquid surface at an oblique angle thereto, and providing a reflected beam therefrom;

a beam expander interposed between said illumination source and said liquid surface for increasing said narrow beam width of said incident beam to a beam width substantially greater than the wavelength of most disturbances in said liquid surface;

a converging lens transverse to and intercepting a portion of

said reflected beam from said liquid surface for focusing said portion of said reflected beam to a centrum; and



a beam detector positioned adjacent to said centrum for providing an indication of changes in said level of said liquid surface by detecting corresponding changes in a relative position of said centrum.

4,508,971

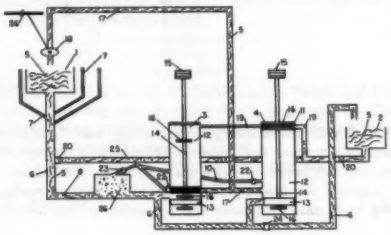
TWO RESERVOIR SOLAR AIR-WEIGHT IMPELLING HYDRO POWER SYSTEM

Wayne E. Bailey, R.D. #2, Schaghticoke, N.Y. 12154

Filed Aug. 9, 1982, Ser. No. 406,264

Int. Cl.³ F03G *7/02, 7/04;* **F04F** *1/18*

U.S. Cl. 290—1 R **2 Claims**



1. A method of using heat to produce work, comprising the steps of:

(a) entraining gas into a flow of liquid from an upper reservoir;

(b) releasing continuous quantities of said entrained gas into a chamber until it is compressed;

(c) exposing said compressed gas to a heat source and releasing it into a vertically movable container;

(d) allowing said container to rise due to increased buoyancy from said heated compressed gas; and

(e) releasing said compressed gas from said container at a point in its vertical path of travel and allowing said container to fall.

4,508,972

ARMATURE LIFT WINDMILL

Robert W. Willmouth, 1011 Frederick St. South, Arlington, Va. 22202

Filed Jan. 20, 1984, Ser. No. 572,285

Int. Cl.³ F03D *9/00*

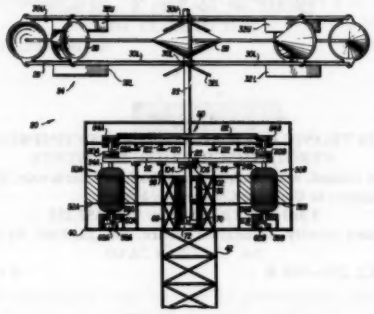
U.S. Cl. 290—55 **28 Claims**

1. An apparatus for generating electricity from wind currents, the apparatus comprising:

a rotatable vertical shaft for supporting impeller means, said impeller means including a horizontally extending frame and a plurality of winddriven elements secured at the periphery of the frame;

airfoil means secured to said frame for providing a vertical lift force to said impeller means and to said rotatable vertical shaft when the wind velocity is of a sufficient magnitude;

electrical generator means comprising a rotor and a coil, said rotor being vertically oriented and capable of slidable



vertical movement with respect to said coil, the lower end of said rotor being selectively positionable upon a support;

means for transmitting the rotational motion of said rotatable vertical shaft to said rotor of said electrical generator means; and,

means for transmitting vertical lift created by said airfoil means to said rotor of said electrical generator means whereby said rotor is vertically lifted above said support upon which the lower end of said rotor would otherwise rest.

4,508,973

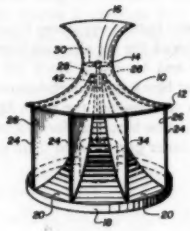
WIND TURBINE ELECTRIC GENERATOR

James M. Payne, 2300 Mardale Dr., York, Pa. 17403

Filed May 25, 1984, Ser. No. 613,808

Int. Cl.³ F03D *3/04*

U.S. Cl. 290—5 S **7 Claims**



1. A wind-operated electric generator system comprising in combination, a stationary Venturi unit having a vertical axis and a circular assembly of similar segmental wind-inlet passages extending around said axis and having substantially vertical inlet openings outermost from said axis, said segmental inlet passages being defined by similar substantially vertical and radially extending walls comprising the sides of said segmental passages and said inlet openings also each having similar top and bottom walls curved inwardly toward said axis and upwardly and said bottom walls sloping upwardly to a greater extent than said top walls and converging at the upper ends thereof toward the upper and inner portions of said top wall to

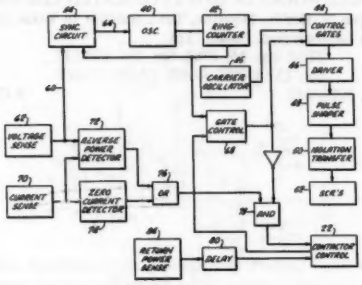
provide with the upper portions of said top walls constricted upwardly directed exit passages for wind merging into a single upwardly directed discharge opening comprising a Venturi discharge throat, whereby the converging of said walls toward the axis of the unit provides additional compression of incoming wind and thereby further enhances the increasing of inlet air speed generated by the converging top and bottom walls of said inlet passages, a radial bladed impeller mounted within said Venturi throat and supported by a shaft coincident with the axis of said Venturi throat, bearing means for said shaft, an electric generator supported relative to said shaft and connected thereto for operation thereby when driven by wind passing through said throat and the blades of said impeller to drive the same, whereby wind blowing from any direction will enter at least one of said inlet openings and be directed upwardly by the passage thereof while the speed thereof is increased by said Venturi effect produced by both lateral and vertical compression of the incoming gas.

4,508,974

EMERGENCY POWER SYSTEM AND LOGIC THEREFOR

Lawrence E. Henderson, Anaheim, Calif., assignor to Emergency Power Engineering, Inc., Costa Mesa, Calif.

Filed Aug. 9, 1982, Ser. No. 406,348
Int. Cl.³ H02J *9/06*
U.S. Cl. 307—66 **6 Claims**



1. In combination with a motor generator set and a multiphase primary power source connected thereto to energize the motor generator set and provide power to a load, a standby emergency power supply connected in series between the source and motor generator set, said standby power supply comprising

an inverter having a plurality of switching devices,

first and second power switching contacts operable between a normal state in which said primary power source is connected to said motor generator and said inverter is disconnected from said motor generator, and an emergency state in which said primary power source is disconnected from said motor generator and said inverter is connected to said motor generator,

logic circuit means for controlling said inverter and said power switching contacts, and

an auxiliary power supply for providing power to said logic circuit means and to said inverter, said logic circuit comprising

trigger generating means for generating a plurality of inverter switching device trigger signals,

driving means responsive to said trigger signals for triggering said inverter switching devices,

an oscillator connected to clock said trigger generating means,

means for sensing motor voltages,

synchronizing means responsive to said trigger generating means and to said motor voltage sensing means to cause the phase and frequency of said oscillator to track phase and frequency of said motor voltage,

means for sensing current of said motor,

reverse power detecting means responsive to said motor voltage sensing means and to said current sensing means for providing a reverse power signal indicative of reverse power from said motor,

means responsive to said current sensing means for providing a zero current signal indicative of lack of current from said motor, and

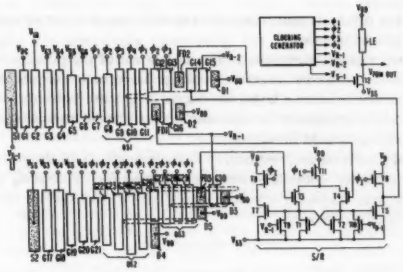
emergency control means responsive to either said reverse power signal or to said zero current signal for controlling transmission of said trigger signals to said inverter switching devices and for operating said power switching contacts into said emergency state.

4,508,975

PULSE DURATION MODULATOR USING CHARGE COUPLED DEVICES

Leonard R. Rockett, Jr., Washington, D.C., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 426,098
Int. Cl.³ H03K *9/02, 11/00*
U.S. Cl. 307—261 **9 Claims**



1. In combination:

means recurrently sampling an analog input signal voltage for generating pulse-amplitude-modulated (PAM) charge packets;

means for storing each succeeding PAM charge packet until the next is generated;

means operative between generating successive PAM charge packets for removing at a time-invariant rate quanta of charge from said stored charge packet, each quantum equal to a standard decrement of charge so long as said stored charge packet is not depleted; and

means for box-car detecting each train of charge pulses generated by the successively removed charge quanta to obtain a respective duration-modulated pulse component of a pulse-duration-modulated (PDM) signal.

4,508,976

ADJUSTABLE FREQUENCY DRIVE

Mark R. Hickman, Westboro, Mass., and Michael M. Brown, Kingston, N.H., assignors to Vee Arc Corporation, Westboro, Mass.

Continuation-in-part of Ser. No. 359,037, Mar. 17, 1982,. This application Jan. 14, 1983, Ser. No. 457,880
Int. Cl.³ H03K *3/26, 23/22*
U.S. Cl. 307—270 **14 Claims**

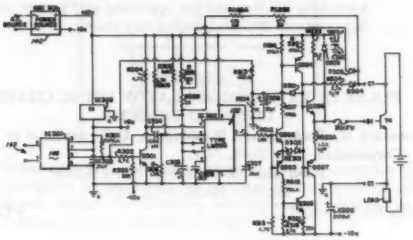
1. A circuit for driving a biased power transistor that is adapted to switch high voltages and that has an input electrode and a pair of output electrodes comprising emitter and collector electrodes, said circuit comprising;

input circuit means for receiving an input control signal for switching said power transistor,

control transistor means coupled from said input circuit means having drive and non-drive states and having its output coupled to the input electrode of said power transistor,

first means, responsive to the magnitude of the power transistor collector-to-emitter voltage exceeding a predetermined threshold, for decreasing drive current from the control transistor means to the power transistor,

second means, responsive to the magnitude of the power transistor base-to-emitter voltage exceeding a predetermined threshold under overload conditions, for decreasing drive current from the control transistor means to the power transistor,



third means, responsive to the magnitude of the power transistor collector-to-emitter voltage being below a predetermined reference level, for decreasing drive current to the power transistor for maintaining the power transistor in a non-saturated condition,

and fourth means, responsive to the magnitude of the power transistor collector-to-emitter voltage for decreasing the power transistor try-time under heavy overload or short circuit conditions.

4,508,977

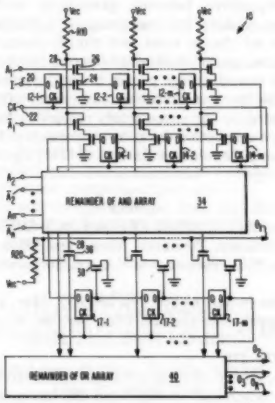
RE-PROGRAMMABLE PLA

David W. Page, and LuVerne R. Peterson, both of San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 11, 1983, Ser. No. 457,175

Int. Cl.[3] **H03K** *19/177, 19/094, 23/24;* **H04Q** *3/00*

U.S. Cl. 307—468 **13 Claims**



1. In a programmable logic array having an AND array disposed for receiving n input signals, an OR array providing K output signals on k output lines and m term lines coupling said AND or OR arrays, wherein n, m, and k are integers greater than one, said array comprising:

a. AND array having n×m cells wherein each cell comprises:

(i) first and second transistor means coupled in series between one of said term lines and a reference potential, each of said transistor means having a control element;

(ii) a first data storage element having an output terminal coupled to the control element of said first transistor means;

(iii) one of said n input terminals being coupled to the control element of said second transistor means;

b. OR array having m×k cells wherein each cell comprises:

(i) third and fourth transistor means coupled in series between one of said output lines and a reference potential, each of said transistor means having a control element;

(ii) a second data storage element having an output terminal coupled to the control element of said third transistor means;

(iii) one of said m term lines being coupled to the control element of said fourth transistor means; and

c. a means for biasing said term lines and said output lines, and an input terminal means for writing data into each of said first and second data storage elements.

4,508,978

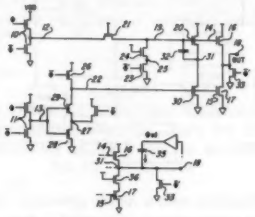
REDUCTION OF GATE OXIDE BREAKDOWN FOR BOOTED NODES IN MOS INTEGRATED CIRCUITS

Chitranjan N. Reddy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 16, 1982, Ser. No. 419,117

Int. Cl.[3] **H03K** *17/08, 17/10, 17/687*

U.S. Cl. 307—482 **9 Claims**



1. A clock generator circuit for producing a high level clock voltage, comprising:

an output transistor, an input transistor, a decoupling transistor, and a pair of discharge transistors, each of such transistors having a source-drain path and a gate,

a clock voltage input connected to the gate of the input transistor, the source-drain path of the input transistor being connected between a supply voltage and an input node,

means connecting the source-drain path of the decoupling transistor in series between said input node and the gate of the output transistor, the gate of the decoupling transistor being coupled to said supply voltage,

the source-drain path of the output transistor being connected between said supply voltage and an output node,

first means for booting said gate of the output transistor to a voltage level higher then said supply voltage at a selected time after a delay, in response to said clock voltage input,

first means for discharging said gate of the output transistor comprising a series connection of the source-drain paths of said pair of discharge transistors connected between said gate of the output transistor and reference potential, the gate of the discharge transistor adjacent said reference potential having a discharge clock voltage thereon and the gate of the other discharge transistor having a said supply

voltage thereon, said discharge clock voltage occurring after said gate of the output transistor is booted,

second means for booting said output node to a voltage level higher than said supply voltage at a time after said selected time,

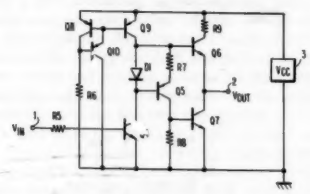
second means for discharging said output node, comprising a series connection of the source-drain paths of a pair of pull-down transistors, the gate of the pull-down transistor adjacent said output node being coupled to said supply voltage and the gate of the other of said pull-down transistors being coupled to turn said other pull-down transistor off at said selected time.

4,508,979

SINGLE-ENDED PUSH-PULL CIRCUIT HAVING A SMALL THROUGH-CURRENT

Hisashi Togari, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1982, Ser. No. 364,335
Claims priority, application Japan, Apr. 1, 1981, 56-48775
Int. Cl.³ H03K *5/13, 3/01*
U.S. Cl. 307—513 **11 Claims**



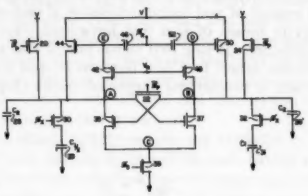
1. An electronic circuit comprising a signal input terminal for receiving an input signal; a first transistor having a control electrode and first and second electrodes; means for connecting said control electrode of said first transistor to said signal input terminal; said first transistor generating at its first electrode an output signal having a phase opposite that of said input signal; a second transistor having a control electrode and first and second electrodes; means for connecting said control electrode of said second transistor to said first electrode of said first transistor; resistor means coupled between said first electrode of said second transistor and a first circuit node; a diode coupled between said first electrode of said first transistor and said first circuit node for conducting current from said first circuit node to said first electrode of said first transistor; a third transistor having a control electrode and first and second electrodes, means for connecting said control electrode of said third transistor to said first circuit node; a fourth transistor having a control electrode and first and second electrodes; means for connecting said control electrode of said fourth transistor to said second electrode of said second transistor; means for connecting said second electrode of said third transistor and said first electrode of said fourth transistor, an output terminal coupled to the connection point between the second electrode of said third and the first electrode of said fourth transistor, source means, including a power voltage terminal, for applying a source potential across said first electrode of said third transistor and said second electrode of fourth transistor, and a supply means coupled between said first circuit node and said power voltage terminal for supplying current to said first circuit node.

4,508,980

SENSE AND REFRESH AMPLIFIER CIRCUIT

Deepraj S. Puar, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 740,963, Nov. 11, 1976, abandoned.
This application Feb. 1, 1984, Ser. No. 575,724
Int. Cl.³ H03K *5/24, 3/356;* **G11C** *7/06*
U.S. Cl. 307—530 **5 Claims**



1. In an amplifier circuit for sensing stored information, utilized with a voltage supply, the amplifier of the type that is capable of assuming first and second conditions in response to signals at first and second input nodes, the circuit comprising, first and second cross coupled active devices with respective input nodes, each device being capable of assuming a high and a low conduction state, restore circuitry means connected solely between said active device input nodes and the voltage supply for selectively connecting the supply solely to the device assuming a low conduction state, said restore circuitry connected to the cross coupled devices including third, fourth, fifth and sisth active devices having control, common and output elements and first and second coupling means, the third and fourth device common elements together connected to a first input node, the fifth and sixth device common elements together connected to a second input node, the output element of the third connected to the control element of the fourth and the output element of the fifth connected to the control element of the sixth, the output of the fourth and sixth devices connected to the voltage supply, the control element of the third and fifth connected to an additional voltage supply, the first coupling means connected for coupling control signals to the control element of the fourth device, and the second coupling means connected for coupling control signals to the control element of the sixth device, and means for alternately precharging said nodes to a predetermined state and applying stored information to the input nodes to cause the amplifier to assume first and second conditions in response to said stored information.

4,508,981

DRIVER CIRCUITRY FOR REDUCING ON-CHIP DELTA-I NOISE

Jack A. Dorler, Wappingers Falls; Joseph M. Mosley, Hopewell Junction, and Stephen D. Weitzel, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation

Filed Jun. 28, 1982, Ser. No. 392,982
Int. Cl.³ H03K *3/013, 19/003, 17/16*
U.S. Cl. 307—542 **8 Claims**

1. In an integrated circuit packaging structure, at least a first integrated circuit chip, said first integrated circuit chip being contained on said packaging structure and having off-chip driver circuit means, at least a second integrated circuit chip, said second integrated circuit chip being contained on said packaging structure and having chip receiver circuit means, said integrated circuit packaging structure including electrical connection means for connecting said off-chip driver circuit means of said first chip to said chip receiver circuit means of said second chip, said off-chip driver circuit means including noise suppression circuit means, said integrated circuit packaging structure being further characterized as follows:

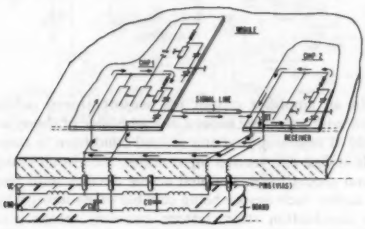
said off-chip driver circuit means of said first chip including an output transistor having a collector, base and emitter;

a first package inductance and a resistor serially connected between said collector of said output transistor and a first potential source;

said base of said output transistor being adapted to receive an input signal;

said electrical connection means of said integrated circuit packaging structure having at least a first signal line and a first reference potential line for providing electrical connection between said first and second chips;

said emitter of said output transistor of said off-chip driver circuit means of said first integrated circuit chip being connected via said first signal line of said electrical connection means to a first terminal of said receiver circuit means of said second integrated circuit chip;



said noise suppression circuit means comprising a serial two terminal non-linear impedance, a first terminal of said serial two terminal non-linear impedance being connected to said collector of said output transistor contained on said first chip; and

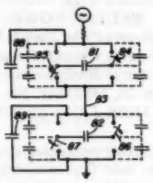
a second package inductance, said second package inductance being serially connected between a second potential source and via said first reference potential line of said electrical connection means to said second terminal of said serial two terminal non-linear impedance and a second terminal of said receiver circuit means contained on said second chip.

4,508,982

FLOATING NODE STABILIZING CIRCUIT FOR A SWITCHED-CAPACITOR CIRCUIT AND FILTER

Christopher W. Kapral, Pasadena, Calif., and Michael Cooperman, Framingham, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 29, 1982, Ser. No. 426,353
Int. Cl.³ H03K *17/16, 17/693*
U.S. Cl. 307—572 **4 Claims**



1. In a switched capacitor filter including two switching capacitors, one of said switching capacitors capable of having one plate thereof switched between a first voltage potential and a nodal point and to have a second plate thereof switched between said nodal point and said first voltage potential, and the other of said switching capacitors capable of having one plate thereof switched between said nodal point and a second voltage potential and to have a second plate thereof switched between said second voltage potential and said nodal point, the switching of said plates occurring synchronously whereby repetitive switching tends to cause an undesirable charge to accumulate at said nodal point, the improvement for preventing said undesirable charge from accumulating on said nodal point comprising

a first fixed capacitor coupled across said first voltage potential and said nodal point, and

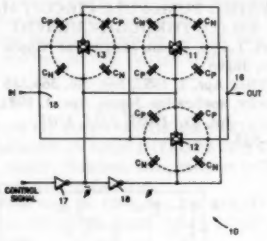
a second fixed capacitor coupled across said second voltage potential and said nodal point.

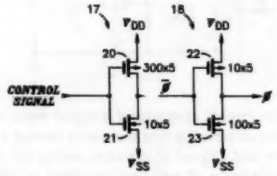
4,508,983

MOS ANALOG SWITCH DRIVEN BY COMPLEMENTARY, MINIMALLY SKEWED CLOCK SIGNALS

Robert N. Allgood; Joe W. Peterson, and Roger A. Whatley, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 10, 1983, Ser. No. 465,408
Int. Cl.³ H03K *17/16, 17/687, 19/096*
U.S. Cl. 307—577 **12 Claims**





1. An MOS analog switch, comprising:

first, second and third MOS transmission gates, each transmission gate having a transistor of first conductivity type utilizing a first current electrode as an input terminal, a second current electrode as an output terminal, and a control electrode, the input terminals of the first, second and third transmission gates connected together to form an input of said switch, the output terminals of the second and third transmission gates connected together to form an output of said switch, and the output terminal of said first transmission gate connected to both input terminals of said second and third transmission gates; and

clock means for providing a clock signal to the control electrodes of said second and third transmission gates, and for providing a complement clock signal to the control electrode of said first transmission gate, comprising:

first inverter means having an input for receiving a control signal, and an output for providing said complement clock signal; and second inverter means having an input coupled to the output of said first inverter means and an output for providing said clock signal, wherein:

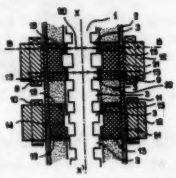
said first and second inverter means have transistors with control electrode dimensions ratioed in a predetermined manner to minimize the delay between said clock signal and its complement.

4,508,984

VARIABLE RELUCTANCE ELECTRIC MOTOR FOR THE TRANSLATION OF CONTROL RODS IN A NUCLEAR REACTOR

F. Guedj; J. Defaucheux, both of Jeumont, and A. Wiart, Sannois, all of France, assignors to Jeumont-Schneider Corporation, France

Filed Jul. 8, 1982, Ser. No. 396,489
Claims priority, application France, Jul. 8, 1981, 81 13448; Apr. 30, 1982, 82 07540; May 27, 1982, 82 09303
Int. Cl.³ H02K *41/00*
U.S. Cl. 310—14 8 Claims



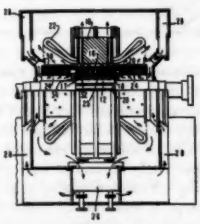
1. A variable-reluctance electric motor having a moving component arranged in a tight cylindrical casing, characterized by the fact that the moving component comprises a shaft of magnetic material provided with regularly spaced projections defining cavities therebetween, and by at least three multipolar stators arranged along the shaft consecutively in a direction of movement of said moving component, each stator comprising a core including a pair of core parts arranged diametrically opposite each other outside of said casing with magnetic tips extending the core parts inside the casing, said tips having cavities facing the shaft and defined by projections of the same width and spacing as those of the shaft, with the spacing between said stators being such that the projections of the shaft and those of the tips face one another for only one of the stators, and coils on the core parts oriented to produce magnetic flux along paths extending transversely to and through the shaft and casing between each pair of tips and not substantially along the length of the shaft, said stators having yoke means external thereto to close the magnetic flux paths between each pair of tips.

4,508,985

DYNAMOELECTRIC MACHINE WITH ROTOR VENTILATION SYSTEM INCLUDING AXIAL DUCT INLET FAIRING

Dennis Pavlik, Murrysville, and Richard A. Gronholm, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1983, Ser. No. 552,592
Int. Cl.³ H02K *9/00*
U.S. Cl. 310—55 4 Claims



1. A dynamoelectric machine comprising:

a stator and a rotor centrally disposed on a shaft for rotation within said stator;

said rotor comprising an outer body portion having axially opposing end faces, said body portion having a plurality of axially extending coil slots in each of which is located an insulating slot cell adjacent the surface of said body portion, an axial ventilating channel at the bottom of each said slot, a plurality of coil turns, and a wedge closing the upper end of each said slot;

said coil turns extending axially out of said body portion beyond at least one of said end faces, said cell and said channel extending axially out of said body portion beyond said end face to an extent less than said coil turns;

a fairing of solid material disposed outward from said at least one of said end faces between said shaft and the extended portions of said coil turns, said fairing extending beyond the axial extent of said cell and said channel and less than the extent of said coil turns; and

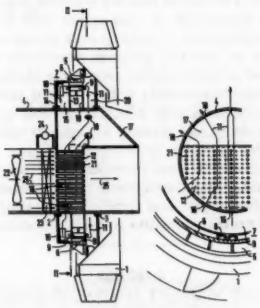
said fairing fitting closely around the extended portion of said cell and, at the inlet to said channel, having a curved portion providing a smooth flow transition region through which coolant gas flows into said channel without encountering the protruding sharp edges of said channel and said cell that would disturb the flow and cause a higher pressure drop.

4,508,986

ELECTRIC MOTOR DRIVE FOR A SLOW-RUNNING ANNULAR ROTOR OF A PROCESSING MACHINE

Detlef Vandamme, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 13, 1983, Ser. No. 560,943
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3247888
Int. Cl.³ E02F *3/29*
U.S. Cl. 310—67 R 6 Claims



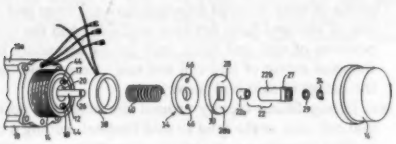
1. A drive for a slow-running annular rotor of a machine, the drive comprising a tubular body, two bearings spaced apart from each other axially along the tubular body for rotatably supporting the rotor on the tubular body, an electric motor for driving the rotor having a motor rotor disposed between the two bearings fastened to the annular rotor and a stator supported between the two bearings on the outside of the tubular body, the electric motor being of encapsulated design, a closed cooling loop including the electric motor and a heat exchanger through which a gaseous coolant is circulated to cool the electric motor, and means for conducting the coolant with forced circulation in the closed cooling loop, the heat exchanger being disposed in the interior of the tubular body.

4,508,987

HERMETIC COMPRESSOR INCLUDING A TERMINAL BLOCK AND THERMAL PROTECTION RETAINER MEANS

William T. Ladusaw, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 6, 1984, Ser. No. 597,683
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—68 C **4 Claims**



1. A hermetic compressor including a casing having a side wall, a lower wall, and an upper wall provided with an opening and a vertically extending stud member secured to said upper wall;

an electric terminal disposed in said opening;

conductor pins arranged in said terminal including end portions projecting outwardly from said casing;

a terminal receptacle block assembly having female terminals removably receiving said end portion of said conductor pins;

a thermal overload protector including a base wall located on said casing upper wall and having an upper wall with a central depression;

a retainer arrangement removably securing said terminal receptacle block relative to said electric terminal and said thermal overload protector relative to said casing upper wall comprising:

an arcuate resilient retainer means formed of stiffly flexible metal stock, the apex of said arcuate retainer means including an elongated central opening removably receiving said stud member, leg portions diverging downwardly and outwardly from said apex, a downward projection on the end portion of one of said leg portions removably engaging said depression on said upper wall of said thermal overload protector, a holding area on the end portion of the other of said leg portions removably engaging the upper end of said terminal receptacle block;

a post member threadably engaging said stud member including an enlargement which removably applies pressure on said apex of said retainer to cause its said end portions of said leg portions to forceably engage said terminal block and said thermal overload protector to removably secure said terminal receptacle block assembly relative to said conductor pins and removably securing said thermal overload protector relative to said compressor upper wall.

4,508,988

PERMANENT MAGNET MOTOR STATOR FOR D.C. MOTORS

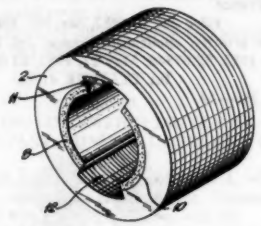
Leon G. Reiss, Dublin, and Roy D. Schultz, Radford, both of Va., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 451,857, Dec. 21, 1982, abandoned. This application Dec. 8, 1983, Ser. No. 559,446
Int. Cl.³ H02K *21/26*
U.S. Cl. 310—154 **10 Claims**

1. In a permanent magnet commutator type D.C. servomotor of the type having a wound iron core armature, wherein the improvement comprises:

a permanent magnet stator core including an annular yoke having a central axial opening, and

a plurality of permanent magnet pole pieces within said opening and spaced equally from and about the axis of said yoke, each of said pole pieces including an arcuate permanent magnet and an arcuate member of magnetic material intermediate said permanent magnet and said yoke, the adjoining ends of said arcuate magnets and said arcuate members of magnet material forming a relieved interpole



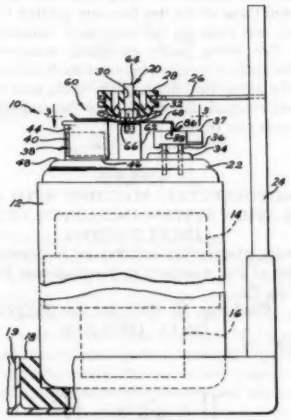
area; wherein the ratio of the combined radial thicknesses of said arcuate permanent magnet and said arcuate member of magnetic material to the combined radial thickness of said arcuate permanent magnet, said arcuate member of magnetic material and said annular yoke is 0.44±20%.

4,508,989

CORE ELEMENT FOR ELECTRODYNAMIC ROTARY MACHINE

Carleton E. Sawyer, Littleton, and Hugh C. Masterman, Westford, both of Mass., assignors to Display Components, Inc., Westford, Mass.

Filed May 19, 1983, Ser. No. 495,962
Int. Cl.³ H02K *3/00*
U.S. Cl. 310—184 **23 Claims**



1. A ϕ-phase electrodynamic rotary machine of the type including a pair of magnetic core elements coaxially mounted and rotatable relative to one another about a common axis, at least one of said core elements including a plurality of slots "s" formed in at least one of said core elements and a plurality of coil windings respectively wound in said slots, said slots and coil windings being circumferentially spaced in a predetermined pattern around at least one of said core elements about said common axis so that as said elements rotate relative to one another at a substantially constant speed in response to a balanced sinusoidal excitation signal having ϕ phases, the particular energy distribution around at least one of said core elements is a substantially balanced sinusoidal field around at least one of said core elements, said field providing a peak value for each of

said ϕ phases, said peak values of said phases being equiangularly distributed around at least one of said core elements, and

wherein said coil windings are wound in said slots so that the number of turns of each of the coil windings associated with each phase are such that the $(6c+3)$ harmonics of said energy distribution for that phase are reduced to substantially zero, wherein c=any interger including zero,

and wherein said predetermined pattern is such that

(1) slots in each 90° quadrant of at least one of said core elements defined by mutually perpendicular radial axes extending normal to said common axis, are nonuniformly angularly spaced within said quadrant and symmetrically arranged with corresponding slots in each adjacent 90° quadrant about the radial axis disposed therebetween so as to reduce the even harmonics in said field to substantially zero;

(2) each of said 90° quadrants is divided into $90°/\phi$ segments; and

(3) the slots in each of said segments are symmetrically arranged with slots in each of the adjacent segments about a radially-directed line between adjacent segments so as to reduce at least the third and fifth harmonics of said balanced sinusoidal field to substantially zero.

4,508,990

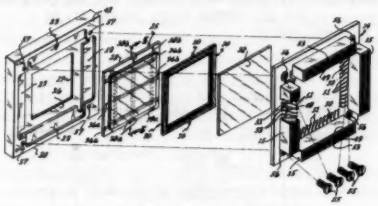
THIN-FILM EL PANEL MOUNTING UNIT

Walter F. Essinger, Thousand Oaks, Calif., assignor to Sigmatron Associates, Los Angeles, Calif.

Filed Sep. 17, 1982, Ser. No. 419,176

Int. Cl.³ H05B *33/04, 33/06;* **H01J** *5/50;* **H01R** *9/00*

U.S. Cl. 313—50 **11 Claims**



1. A display panel mounting unit comprising:

a thin-film EL display panel including a glass substrate with crossed-grid electrodes formed on the back surface thereof providing terminals having a fixed spacing on each marginal side thereof;

a frame support having a central opening and a recess on the back thereof surrounding said opening;

said panel positioned with its front edges seated in the recess of said frame support;

a printed circuit board having rows of inner and outer connecting holes and a row of routing holes on each side portion thereof, each said hole being plated-through;

each side portion of the front surface of said printed circuit board having a plurality of conductive paths with end portions having said fixed spacing, alternate ones of said conductive paths respectively connected to the inner connecting holes and the remaining ones of said conductive paths respectively connected to the routing holes;

each said side portion of the back surface of said printed circuit board provided with a plurality of conductive paths respectively connecting each routing hole to an outer connecting hole;

a plug connector positioned on each side portion of the back surface of said printed circuit board, each said plug connector having two rows of contacts with leads respectively connected to the rows of inner and outer connecting holes on said printed circuit board;

a strip of conductive elastomeric connector having closely spaced transverse conductive layers therein positioned to lie over the terminals on each marginal side of the back surface of said substrate; and

means for attaching said printed circuit board on the back of said frame support with the end portions of the conductive paths on each side portions of the front surface thereof positoned to lie over each said strip of conductive elastomeric connector.

4,508,991

HALOGEN CYCLE INCANDESCENT LAMP AND METHOD FOR THE PROTECTION OF ITS INNER SURFACE

Ewald Würster, Grünwald, and Albert Heidemann, Herbrechtingen, both of Fed. Rep. of Germany, assignors to Patent Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,866

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139294

Int. Cl.³ B05D *5/12;* **H01K** *1/32, 1/50*

U.S. Cl. 313—579 **23 Claims**

1. A halogen cycle incandescent lamp having a bulb comprising a potassium or sodium containing soft glass and an inert fill containing a halogen additive, the inner surface of said soft glass having been treated to remove the potassium or sodium ions therefrom so that during operation of the lamp, the sodium or potassium component of the soft glass will not be available to react with the halogen additive component of the fill gas.

4,508,992

MICROWAVE AMPLIFIER TUBE HAVING TWO RING RESONATORS

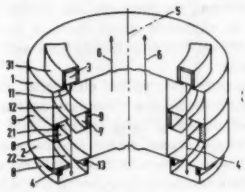
Heinz Bohlen, Hamburg, and Enzio Demmel, Quickborn, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,594

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1981, 3126119

Int. Cl.³ H01J *23/18, 25/04*

U.S. Cl. 315—5.39 **11 Claims**



1. A microwave amplifier tube comprising:

(a) a ring-shaped cathode disposed about an axis for emitting electrons in a direction parallel to said axis;

(b) a ring-shaped input resonator for receiving a microwave input signal, said input resonator being disposed about the axis, being arranged relative to the cathode to enable emitted electrons to pass through the resonator, and having an annular output slot for enabling said emitted electrons to leave the resonator in a direction parallel to the axis,

said input signal effecting formation of the emitted electrons into a beam which leaves the resonator through the annular output slot and rotates around said axis;

(c) a ring-shaped output resonator for producing a microwave output signal, said output resonator being disposed about the axis and having an annular input slot axially-spaced from said annular output slot for enabling the

electron beam to enter the output resonator and effect production of said output signal; and

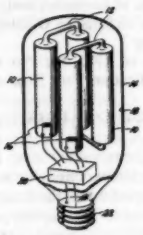
(d) collector means for collecting the electrons in the beam after the beam enters the output resonator.

4,508,993

FLUORESCENT LAMP WITHOUT BALLAST

John M. Anderson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 324,925, Nov. 25, 1981, abandoned.
This application Oct. 3, 1983, Ser. No. 538,694
Int. Cl.³ H01J *7/44*
U.S. Cl. 315—59 **1 Claim**



1. A lamp operable without a ballast for regulating lamp current, comprising:

at least three evacuable, light-transmissive discharge tube sections have a relatively large diameter;

at least two evacuable capillary tube sections having a relatively small diameter, each capillary tube section joining an adjacent part of said relatively large diameter discharge tube sections and being in gaseous communication therewith;

an ionizable discharge medium disposed within said discharge tube sections and within said capillary tube sections;

a pair of electrodes disposed within distinct discharge tube sections at opposite ends of said lamp, said lamp having a positive volt-ampere characteristic across the lamp from electrode to electrode when there is an arc discharge through said discharge tube sections and said capillary tube sections;

starter means connected to said electrodes; and

an outer light-transmissive phosphor coated envelope enclosing said discharge tube sections, said capillary tube sections and said starter means, said outer envelope being configured with a screw-in base, and said discharge tube sections being substantially cylindrical and being arranged in a configuration in which the cylindrical axes are substantially parallel.

4,508,994

HEAT-SENSITIVE VARIABLE-RESISTANCE LIGHT SOCKET INSERT

Henry H. Kolm, Wayland, and Eric A. Kolm, Brookline, both of Mass., assignors to Piezo Electric Products, Inc., Cambridge, Mass.

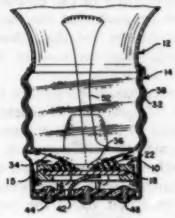
Filed Mar. 30, 1983, Ser. No. 480,346
Int. Cl.³ H05B *37/00*
U.S. Cl. 315—200 R **21 Claims**

1. A heat-sensitive variable-resistance insert device for use with a light bulb and socket comprising:

a heat-sensitive variable-resistance wafer;

a perimetrical ceramic insulation member surrounding the edge of said wafer and electrically insulating it from the wall of the socket;

said wafer having a contact area on one side for engaging the central contact of the socket and on the other side for engaging the central contact of the light bulb; and



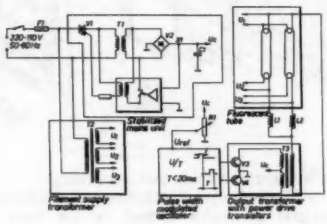
an adhesive paste on said other side of said wafer within said perimetrical member for adhering the device to the base of a light bulb.

4,508,995

METHOD OF ELIMINATING DISCOMFORTING FLICKERING WHEN VIEWING X-RAY FILM IN A LIGHT CABINET, AND A FLICKER-ELIMINATING UNIT FOR USE IN A LIGHT CABINET

Rickard Gajecki, Lidingö, Sweden, assignor to AO:s Metall & Mek. Verkstad AB, Stockholm, Sweden

PCT No. PCT/SE81/00190, § 371 Date Mar. 10, 1982, § 102(e) Date Mar. 10, 1982, PCT Pub. No. WO82/00367, PCT Pub. Date Feb. 4, 1982
PCT Filed Jun. 26, 1981, Ser. No. 359,669
Claims priority, application Sweden, Jul. 18, 1980, 8005271
Int. Cl.³ H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **6 Claims**



1. A method of eliminating discomforting flickering when viewing an under-exposed portion of X-ray film in a light cabinet having fluorescent tube means supplied with alternating current mains voltage of a given frequency via a filament transformer, and for regulating the light intensity, said method comprising the steps of:

stabilizing and rectifying the mains voltage to obtain a substantially smooth and non-pulsing d.c. voltage;

viewing said underexposed portion of said X-ray film; generating a nominal voltage having a predetermined frequency determined by:

seting a level of voltage utilizing said d.c. voltage to reduce flickering of said fluorescent tube means while viewing said X-ray film;

generating pulse-width signals wherein the pulse width and the magnitude thereof are determined by said level of voltage;

transforming said pulse-width signals into said nominal voltage such that said predetermined frequency corresponds to said pulse width of said pulse-width signals;

choking said nominal voltage having said predetermined frequency to impede the current in accordance with the current requirements for said fluorescent tube means,

applying the choked nominal voltage to said fluorescent tube means.

4,508,996

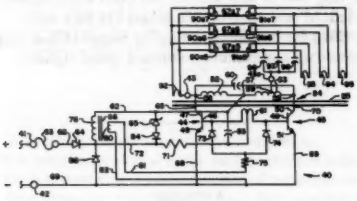
HIGH FREQUENCY SUPPLY SYSTEM FOR GAS DISCHARGE LAMPS AND ELECTRONIC BALLAST THEREFOR

John C. Clegg, and Ariel R. Davis, both of Provo, Utah, assignors to Brigham Young University, Provo, Utah

Continuation-in-part of Ser. No. 161,914, Jun. 23, 1980, abandoned. This application May 3, 1982, Ser. No. 373,994

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—224 **3 Claims**



1. An electrical system for supplying a high frequency AC voltage to gas discharge lamps, said system comprising:

(a) rectifier means for converting an AC voltage to a rectified DC voltage,

(b) inverter means having a pair of input terminals and a pair of output terminals, said inverter means coupled to the output of said rectifier means for converting said rectified DC voltage appearing across said pair of input terminals to a high frequency AC voltage across said pair of output terminals, said inverter means comprising:

(1) oscillator means comprising first and second switching transistors, each of said transistors having a base, collector and emitter, the emitters of said transistors connected to one of said pair of input terminals,

(2) tuned circuit means, said tuned circuit means comprising a transformer having first and second series-connected inductive windings respectively connected to the output terminals and connected with the collectors of said transistors, a feed back winding connecting the bases of said transistors,

(3) inductor means connected between the other one of said pair of input terminals and a junction point intermediate said first and second inductive windings for limiting the current in the collectors of said first and second transistors during the time period of simultaneous conduction of said transistors, and

(4) capacitor means coupled between said junction point and said feedback winding for increasing the switching of said first and second transistors by decreasing base current of the transistor that is turning off and increasing base current of the transistor that is turning on; and

(c) means coupling at least one gas discharge lamp to the pair of output terminals of said inverter means.

4,508,997

LIGHTING CONTROL SYSTEM

John P. Woodnutt, London, England, assignor to Delmatic Limited, London, England

Filed Apr. 15, 1983, Ser. No. 485,244

Claims priority, application United Kingdom, May 10, 1982, 8213499

Int. Cl.³ H05B *37/02*

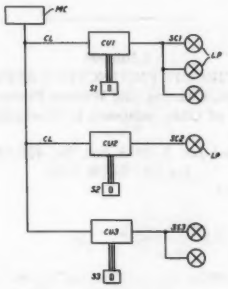
U.S. Cl. 315—360 **2 Claims**

1. A lighting system comprising

a plurality of lighting sub-circuits;

a master control;

local control units each arranged for operation in response to a signal from the master control to temporarily interrupt the lighting on one or more lighting sub-circuits associated with the respective local control unit during a delay



period, to provide a warning, and to switch off the lighting at the end of the delay period; and

a manually-operable switch associated with each local control unit, and actuable during the delay period to inhibit the switching off of said one or more lighting sub-circuits under the control of the respective local control unit.

4,508,998

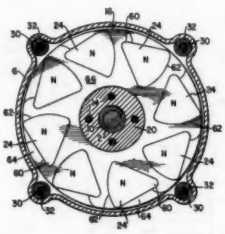
BRUSHLESS DISC-TYPE DC MOTOR OR GENERATOR

James H. Hahn, Fort Lauderdale, Fla., assignor to David H. Rush, Hollywood, Fla.

Filed Feb. 9, 1981, Ser. No. 232,810

Int. Cl.³ H02K *29/00*

U.S. Cl. 318—138 **26 Claims**



1. An electrical machine comprising

rotor and stator elements,

the rotor element being mounted for rotation about an axis,

one of said elements including a coil arrangement having a plurality of sets of coils,

each set being in a substantially circular arrangement coaxial with and in opposed relationship to said other element,

each coil of each set being angularly offset from a coil of another set,

all said coils being wound in a direction to produce similarly oriented magnetic fields extending between said elements upon having current flow through the coils,

the other of said elements including a permanent magnet arrangement having a plurality of poles facing said coils and having magnetic fields extending between said elements,

all of said poles which face in the same axial direction having the same magnetic orientation,

each of said poles being positioned to face each of said coils sequentially as said rotor element rotates,

said coils and magnets being relatively shaped to provide a gradually varying magnitude of magnetic interaction therebetween as said coils and magnets have relative motion therebetween, and

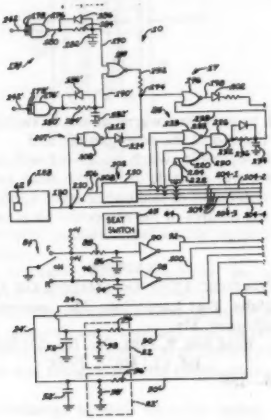
a switching arrangement for rendering said sets of coils alternately conductive.

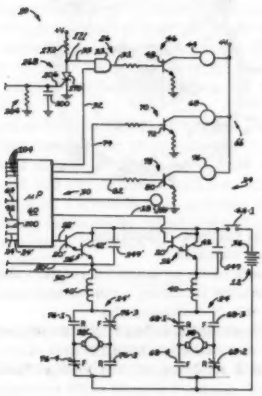
4,508,999

SHORT CIRCUIT PROTECTION APPARATUS

Grant C. Melocik, Chardon, and William Pickering, University Heights, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jan. 5, 1983, Ser. No. 455,723
Int. Cl.³ G05B 5/00
U.S. Cl. 318—331 **12 Claims**





1. In an apparatus (10) for controlling the speed of an electric motor (14,14') in response to receiving a command speed signal having a magnitude responsive to an accelerator pedal (106) position, said apparatus (10) including a power source (12), a processing means (30) for producing a variable frequency and variable duty cycle pulse train, and controllable means (16,16') for connecting and disconnecting said motor (14,14') to and from said power source (12) in response to said pulse train, the improvement comprising:

converting means (22,22') for producing a first logic signal in response to a voltage being applied to said motor (14,14');

said processing means (30) monitoring said first logic signal during only the low periods of said pulse train, producing a second logic signal in response to said first logic signal being greater than a preselected logically high level, and delivering said second signal;

safety means (17) for producing a third logic signal in response to the motor (14,14') and the power supply (12) being connected for a time greater than a preselected period and delivering said third signal;

switching means (26) connected to said processing means (30) and said safety means (17) for disconnecting said motor (14,14') from said power supply (12) in response to receiving one of said second and third logic signals independent of said controllable means (16,16'); and,

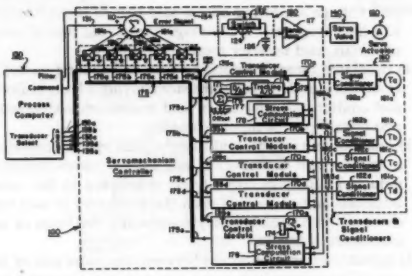
means (216) for disabling said safety means (17) in response to receiving a maximum command speed signal.

4,509,000

BUMPLESS FEEDBACK SWITCHING APPARATUS FOR USE IN A SERVO SYSTEM

Hugo S. Ferguson, Averill Park, N.Y., assignor to Duffers Scientific, Inc., Troy, N.Y.

Filed Mar. 31, 1983, Ser. No. 480,800
Int. Cl.³ G05B 7/00
U.S. Cl. 318—591 **8 Claims**



1. In a servo-mechanism, which is capable of bumplessly switching between at least two feedback transducers, said servo-mechanism being of a type comprised of a summer which produces an error signal which is substantially equal to the difference between a command signal and any one of at least two fed-back output signals, at least two transducers each of which produces a corresponding feedback signal, and at least two circuits each operative in response to a corresponding one of said feedback signals for providing a corresponding one of said fed-back output signals, each of said circuits comprising:

means operative in response to said corresponding feedback signal and to a corresponding one of a plurality of select signals for producing a tracking signal which has a value that either tracks the value of said corresponding feedback signal or remains constant, and

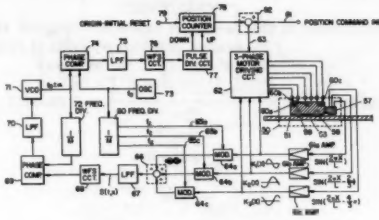
means for subtractively combining said tracking signal with said corresponding feedback signal to produce said corresponding fed-back output signal, and

said servo-mechanism being further comprised of means for generating said plurality of select signals in accordance with the particular transducers being switched.

4,509,001
BRUSHLESS LINEAR SERVOMOTOR

Noriaki Wakabayashi; Terumichi Fukumoto, both of Hirakata, and Nobuhiro Ueda, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 4, 1983, Ser. No. 472,123
Int. Cl.³ G05B *11/00*
U.S. Cl. 318—687 **5 Claims**



1. A brushless linear servomotor comprising:

a first member provided at the surface thereof with magnetic teeth comprising a large number of teeth-like salients and slots arranged lengthwise of said first member at regular pitches, said magnetic teeth being formed on a flat plane of said surface;

a second member movable along said first member and lengthwise thereof and relative thereto and having at least one magnetic cores, said second member comprising magnetic teeth groups engraved on said magnetic cores at the surfaces thereof opposite to said first member, a plurality of coils wound around said magnetic cores, and a guide means which keeps a constant gap between said magnetic cores and said first member to allow said second member to move smoothly relative to said first member;

a plurality of non-contact detectors which are connected to said second member, and which detect said salients and slots of said magnetic teeth of said first member and convert the detected results into electric signals so as to thereby output position signals of sine wave form which are different from each other;

an electronic commutator means for energizing said plurality of coils in the order according to said position signals;

an electronic scale means which electronically measures the position of said second member relative to said first member by demodulating phase information from a carrier wave signal modulated by said position signals; and

a motor driving circuit which extracts a difference between the output of said electric scale means and the input of position command and provides a current to said plurality of coils according to the magnitude of said difference so as to thereby allow said second member to move relative to said first member.

4,509,002
PRECISION X-Y POSITIONER

Ralph L. Hollis, Jr., Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1983, Ser. No. 563,334
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—687 **6 Claims**

1. A precision positioner characterized by

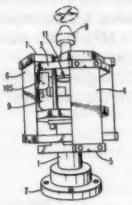
(a) stator means establishing a reference plane having a reference point;

(b) armature means having a reference point, said armature means and said stator means together acting as motor means;

(c) armature support means comprising a basket of two sets of flexure springs suspending said armature from said stator via an intervening spring carrier, establishing said armature in space with freedom of motion in X and Y dimensions about the reference point in an armature plane parallel and close to the reference plane;

(d) armature position sensing means, mounted on said armature means and said stator means at their respective reference points, for sensing the position of said armature;

(e) control computer means;



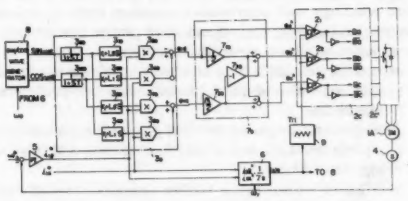
(f) feedback means connecting said armature position sensing means to said control computer means; and

(g) motor control servo means connecting said control computer means and said motor means operatively so as to provide repositioning power to said armature.

4,509,003
VECTOR CONTROL METHOD AND SYSTEM FOR AN INDUCTION MOTOR

Kouhei Ohnishi, Kodaira; Tadashi Ashikaga, Tokyo, and Masayuki Terashima, Sakura, all of Japan, assignors to Kabushiki Kaisha Meidensha, Japan

Filed Mar. 1, 1984, Ser. No. 585,598
Claims priority, application Japan, Mar. 10, 1983, 58-39433; Mar. 10, 1983, 58-39434
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—800 **16 Claims**



1. An induction motor decoupled vector control system, which comprises:

(a) speed sensing means for detecting a rotor angular frequency w_r of an induction motor;

(b) proportional integrating means for generating a primary reference current $i_{1\beta}$ corresponding to a secondary reference driving current on the basis of a difference between a reference rotor angular frequency w_r and a detected rotor angular frequency w_r in order to obtain a reference torque;

(c) supply voltage angular frequency calculating means for calculating a primary supply voltage angular frequency w_0 on the basis of the primary reference current $i_{1\beta}$, a primary reference current $i_{1\alpha}$ corresponding to a secondary magnetic flux, a detected rotor angular frequency w_r, and a ratio r_2 of a secondary inductance L_2 to a secondary resistance r_2;

(d) SIN/COS signal generating means for generating a sine wave signal with an angular frequency w_0 and a cosine wave signal with an angular frequency w_0, independently;

(e) first calculating means for calculating fixed d-q coordinate primary voltages e_{1d} and e_{1q} on the basis of the pri-

mary reference currents $i_{1\alpha}$ and $i_{1\beta}$ and the sine and cosine wave signals in accordance with following expressions:

$$e_{1d} = (r_1 + L_1S) \cos w_0 t \cdot i_{1\alpha}^* - (r_1 + L_\sigma S) \sin w_0 t \cdot i_{1\beta}^*$$

$$e_{1q} = (r_1 + L_1S) \sin w_0 t \cdot i_{1\alpha}^* + (r_1 + L_\sigma S) \cos w_0 t \cdot i_{1\beta}^*$$

where r_1 denotes a primary resistance; L_1 denotes a primary inductance; L_σ denotes an equivalent leakage inductance $(L_1L_2 - M^2)/L_2$ M: mutual inductance; S denotes a Laplace operator; and

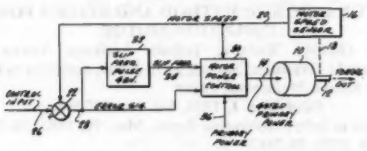
(f) power amplifying means for driving the induction motor on the basis of the calculated primary reference voltages e_{1d}, e_{1q}.

4,509,004

APPARATUS FOR VARIABLE SPEED DRIVE OF AN INDUCTION MOTOR FROM A FIXED FREQUENCY AC SOURCE

Francis H. Shepard, Jr., 16 Lee Lane Countryside, Summit, N.J. 07901

Filed Jul. 6, 1982, Ser. No. 395,331
Int. Cl.³ H02P 5/34
U.S. Cl. 318—801 **13 Claims**



1. A motor control for driving an induction motor of the type having at least first, second and third Y-connected armature windings with ungrounded common from an AC power source having first, second and third phases comprising:

an array of silicon-controlled rectifiers;

means for sensing a time at which a voltage in one of said first, second and third phases reaches a predetermined maximum;

gating means for gating said one phase through said array to a predetermined one of said first, second and third windings at said time;

said gating means being further operative at said time for gating another of said first, second and third phases having a maximum voltage of polarity opposite said predetermined maximum through said array to another predetermined one of said first, second and third windings whereby silicon-controlled rectifiers controlling both positive and negative current flow are simultaneously gated on to provide said current flow through two of said windings in series;

said gating means including means for selecting said predetermined one and said another predetermined one of said first, second and third windings in a sequence effective to produce a rotating magnetic field in said induction motor rotating at a speed related at least to a speed of said motor;

means for controlling a value of said predetermined maximum whereby a torque of said motor is controlled; and

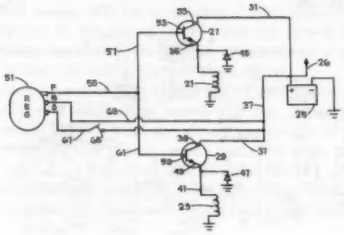
said gating means including means for simultaneously pulsing gates of said silicon-controlled rectifiers at a frequency which is substantially higher than three times the frequency of any one of said first, second and third phases, said frequency being effective to simultaneously trigger said silicon-controlled rectifiers into conduction with minimum delay so that both positive and negative current flow are simultaneously begun.

4,509,005

DUAL ALTERNATOR SYSTEM

Lebern W. Stroud, 321 Charleston Pl., Hurst, Tex. 76053

Filed Jul. 15, 1982, Ser. No. 398,557
Int. Cl.³ H02J 7/00
U.S. Cl. 320—68 **9 Claims**



1. A dual alternator system in a motor vehicle, comprising:

a regulator having first and second terminals,

first and second transistors,

first and second alternators having first and second rotors respectively,

a battery,

means for connecting said first terminal of said regulator to the bases of said first and second transistors,

means for connecting said second terminal of said regulator to the plus terminal of said battery,

means for connecting the collectors of said first and second transistors to the plus terminal of said battery,

means for connecting the emitter of said first transistor to said first rotor for supplying current to said first rotor from said battery by way of said first transistor, and

means for connecting the emitter of said second transistor to said second rotor for supplying current to said second rotor from said battery by way of said second transistor,

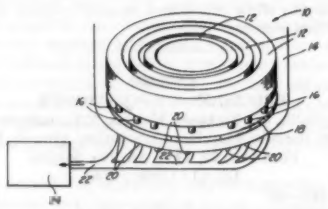
said regulator sensing the voltage output of said battery by way of said second terminal and controlling said two transistors by way of said first terminal.

4,509,006

MULTIPLE ANNULUS ENERGY STORAGE SYSTEM

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 26, 1984, Ser. No. 593,259
Int. Cl.³ H02K 7/02
U.S. Cl. 322—4 **4 Claims**



1. A multiple annulus energy storage system for generating and storing electrical power, the system comprising:

a stationary housing;

a plurality of rotating annuli, the annuli disposed inside each other and received inside the housing;

electrical poles connected to each of the annuli;

field coils mounted in the housing and disposed adjacent the electrical poles; and

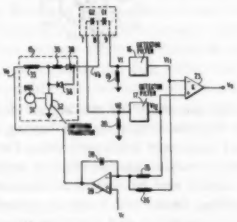
a power system controller connected to the field coils for receiving electrical energy therefrom and reversing the polarity of the system and exciting the coils for rotating the annuli during start up.

4,509,007

DIFFERENTIAL SENSOR MEASURING APPARATUS AND METHOD INCLUDING SENSOR COMPENSATOR CIRCUITRY

Rudolf H. Barsotti, and Arthur W. Grove, both of Tucson, Ariz., assignors to IBM Corporation, Armonk, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,726
Int. Cl.³ G01R *11/52, 27/26*
U.S. Cl. 324—60 C **8 Claims**



1. In a measuring system wherein first and second differential voltages V_1, V_2 are produced from a sensor for indicating the value of a sensed condition, apparatus for compensating changes in the response of said sensors comprising:

means for summing said first and second differential voltages to provide a composite correction signal of V_1+V_2;

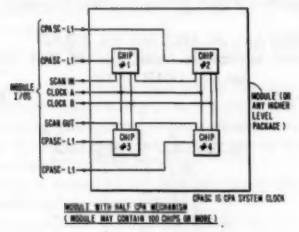
means for multiplying each of said differential voltages by the reciprocal of V_1+V_2 whereby first and second weighted voltages are produced.

4,509,008

METHOD OF CONCURRENTLY TESTING EACH OF A PLURALITY OF INTERCONNECTED INTEGRATED CIRCUIT CHIPS

Sumit DasGupta, Wappingers Falls; Matthew C. Graf, Highland; Robert A. Rasmussen, LaGrangeville, all of N.Y., and Thomas W. Williams, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 370,214, Apr. 20, 1982,. This application Apr. 10, 1984, Ser. No. 598,638
Int. Cl.³ G01R *31/28*
U.S. Cl. 324—73 R **1 Claim**



1. A method for concurrently electrically testing each integrated circuit chip in a high density electronic packaging structure containing at least first, second, third and fourth integrated circuit chips, said packaging structure comprising,

an array of package contacts, said array of package contacts including a CPA-SCL1 package contact, a CPA-SCL2* package contact, an A-clock package contact, a B-clock package contact, a scan-in package contact and a scan-out package contact,

at least first, second third and fourth integrated circuit chips, each of said integrated circuit chips including a CPA-SCL1 chip contact, a CPA-SCL2* chip contact, an A-clock contact, a B-clock chip contact, a scan-in chip contact, and a scan-out chip contact,

each of said integrated circuits including logic circuit means having at least first and second inputs and at least first and second outputs, at least first and second receiver circuits, each of said receiver circuits having an input and an output, at least first and second off-chip driver circuits, each of driver circuits having an input and an output,

each of said integrated circuit chips having scan circuit means, said scan circuit means having an input connected to said scan-in chip contact and an output connected to said scan-out chip contact, said scan circuit means of each of said integrated circuit chips comprising a plurality of serially connected shift register latch circuits, at least first and second ones of said plurality of shift register latch circuits, each having an L1 latch and an L2* latch, said remaining ones of said shift register latch circuits of said plurality of shift register latch circuits each having an L1 latch and an L2 latch said A-clock chip contact being connected to said scan circuit means, said B-clock chip contact being connected to said scan circuit means,

said scan circuit means of each of said integrated circuit chips having a first L1 iatch and a second L1 latch, said first and second L1 latches each having an input, an output and a clock input, said first L1 latch having its input connected to said first output of said logic circuit means, said first L1 latch having its output connected to said input of said first off-chip driver circuit, said first L1 latch having its clock input connected to said CPA-SCL1 chip contact, said second L1 latch having its input connected to said second output of said logic circuit means, said second L1 latch circuit having its output connected to said input of said second off chip driver circuit, and said second L1 latch having its clock input connected to said CPA-SCL1 chip contact,

said scan circuit means of each of said integrated circuit chips having said first L2* latch and said second L2* latch, each of said first and second L2* latches having an input, an output and a C* clock input, said input of said first L2* latch circuit being connected to said output of said first receiver circuit, said output of said first L2* latch circuit being connected to said first input of said logic circuit means, said input of said second L2* latch circuit being connected to said output of said first receiver circuit, said output of said second L2* latch circuit being connected to said second input of said logic circuits, said C* clock input of said first L2* latch circuit and said C* clock input of said second L2* latch circuit being connected in common to said CPA-SCL2* chip contact,

packaging wiring means for interconnecting said array of package contacts and said array of chip contacts of each said at least first, second, third and fourth integrated circuit chips, said package wiring means including means for connecting said package scan in contact to said chip scan-in contact of said first integrated circuit chip, said chip scan-out contact of said first chip to said chip scan-in contact of said second chip, said chip scan-out contact of said second chip to said chip scan-in contact of said third chip, said chip scan-out contact of said third chip to said chip scan-in contact of said fourth chip, said chip scan-out contact of said fourth chip to said package scan-out contact, said A-clock package contact in common to said A-clock chip contact of each of said integrated circuit chips, said B-clock package contact in common to said B-clock chip contact of each of said integrated circuit chips, said CPA-SCL1 package contact in common to said CPA-SCL1 chip contact of each of said integrated circuit chips, and said CPA-SCL2* package contact to said CPA-SCL2* chip contact of each of said integrated circuit

chips, said method concurrently determining the electrical integrity of each one of said first, second, third and fourth integrated circuit chips and including in the order recited the following steps:

(a) impress a first known binary pattern on said scan-in package contact;

(b) apply a pulse train of A-clock pulses and a pulse train of B-clock pulses via said A-clock package contact and said B-clock package contact for a predetermined period of time to shift said first known binary pattern, via said scan-in package contact, into said scan circuit means of said first, second, third and fourth integrated circuit chips;

(c) apply a CPA-SCL2* pulse to said CPA-SCL2* package contact;

(d) apply a pulse train of A-clock pulses and a pulse train of B-clock pulses via said A-clock package contact and said B-clock package contact for a predetermined period of time to shift a resultant binary pattern out of said scan circuit means of said first, second, third and fourth integrated circuit chips via said scan-out package contact: and,

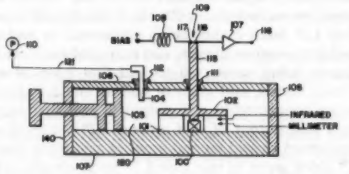
(e) compare the resultant binary pattern appearing at said scan-out package contact with a second known binary pattern to concurrently determine the electrical integrity of each one of said first, second, third and fourth integrated circuit chips.

4,509,009

SINGLE DEVICE FOR MEASUREMENT OF INFRARED OR MILLIMETER WAVE RADIATION

Harold Jacobs, West Long Branch; Samuel Dixon, Jr., Neptune, and Edmund E. Malecki, Rumson, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 19, 1983, Ser. No. 496,165
Int. Cl.³ G01R *23/04*
U.S. Cl. 324—95 **9 Claims**



1. An infrared and millimeter wave radiation detection device comprising:

a biased negative resistance device, self-oscillating within a microwave cavity; one end of said cavity adjacent the device comprising an optical window;

means surrounding said negative resistance device, said means for surrounding being of a semiconductor material;

means for probing the level of power subsistent within said cavity and means for establishing that said power level has experienced a drop;

means connected to said negative resistance device for outputting the signals being generated by said negative resistance device; and means for detecting output signals of said device whose frequency is intermediate between that of a measured wave, and that of the self-oscillating frequency of the said negative resistance device;

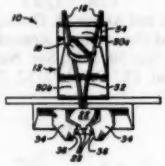
whereby a drop in power represents detection of infrared wave radiation and presence of an intermediate frequency signal represents detection of millimeter wave radiation.

4,509,010

LEAD COMBING APPARATUS FOR RADIAL LEAD ELECTRONIC DEVICES

Nicholas J. Cedrone, 10 Hawthorne Rd., Wellesley Hills, Mass. 02181

Filed Dec. 27, 1982, Ser. No. 452,885
Int. Cl.³ G01R *31/00*
U.S. Cl. 324—158 P **4 Claims**



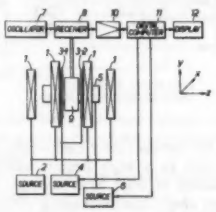
1. In a contactor assembly for making an electrical connection to a radial lead electronic device having a body and at least a center and two outer leads projecting from said body in the same general direction, said contactor assembly having a body, at least a center and two outer contacts secured to said body and extending from said body in generally the same direction and terminating in end portions structured to make electrical connection with said radial leads, said outer contacts having means for steering said outer leads into a known alignment with respect to said contacts, and said center contact being accurately positioned with respect to and positioned to make said electrical connection with said center lead when said device is thus steered, said contactor assembly being driven repeatedly through a closed-loop path of motion that incudes a testing path portion where said contacts are lowered onto said leads and drawn along said leads as an electrical test is performed, wherein the improvement comprises means for combing said radial leads and maintaining a separation between them during said testing, said combing and separation means including at least one blade means formed of a resilient insulating material and associated with each said center contact, means for mounting said blade means to interpose itself between two adjacent ones of said leads during said testing path portion, and means for precisely locating said blade means with respect to said associated center contact to insure that said blade means locates the spacings between said leads as said contactor assembly is lowered and drawn along said leads.

4,509,011

NUCLEAR MAGNETIC RESONANCE DIAGNOSTIC APPARATUS

Hiroshi Sugimoto, Tochigi, and Kozo Satoh, Yokohama, both of Japan, assignors to Tokyo Shubaura Denki Kabushiki Kaisha, Japan

Filed Apr. 30, 1982, Ser. No. 373,627
Claims priority, application Japan, Apr. 30, 1981, 56-65914
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—309 **8 Claims**



1. Nuclear magnetic resonance diagnostic apparatus for

measuring the nuclear magnetic resonance of a specified atomic nucleus in an object, the apparatus comprising:

a magnet apparatus for generating an uniform static magnetic field;

a first coil apparatus for generating a gradient magnetic field;

selective detecting means for detecting the free induction decay signals as to the specified atomic nuclei in a slice portion of the object perpendicular to the direction of said static magnetic field after applying exciting signals to the object positioned in said combined magnetic field;

a current control apparatus for controlling the value of current flowing in said first coil apparatus to shift the selected portion in the direction of said static magnetic field;

a second coil apparatus for generating a gradient magnetic field in the direction in the plane of said selected portion;

means for obtaining the one-directional projection data as to the specified atomic nuclei distribution in said selected portion by processing the free induction decay signals detected by said selective detecting means;

image synthesizing means for producing the extensive one-directional projection image of the specified atomic nuclei distribution in the object by placing a plurality of one-directional projection data corresponding to the different selective planes, obtained by said producing means, in order in the direction of said static magnetic field; and

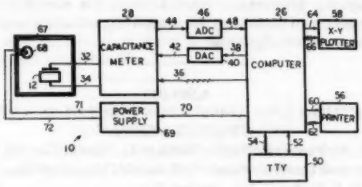
a display for depicting the one-directional projection image produced by said image synthesizing means.

4,509,012

METHOD FOR DETERMINING THE CHARACTERISTIC BEHAVIOR OF A METAL-INSULATOR-SEMICONDUCTOR DEVICE IN A DEEP DEPLETION MODE

Shi-Tron Lin, 10746 Francis Pl., Apt. 139, Los Angeles, Calif. 90034

Filed Dec. 30, 1982, Ser. No. 454,690
Int. Cl.³ G01R *31/26, 27/26*
U.S. Cl. 324—158 D **28 Claims**



1. A method for determining the characteristic behavior of a metal-insulator-semiconductor device in a deep depletion mode, comprising the steps of:

applying a first initial gate voltage to set first initial conditions;

applying a first voltage sweep with the device in the deep depletion mode during at least a portion of the sweep;

determining capacitance-voltage characteristics of the device for a part of the first voltage sweep while the device is in the deep depletion mode;

applying a second initial gate voltage to set second initial conditions;

applying a second voltage sweep with the device in the deep depletion mode during at least a portion of the sweep;

determining capacitance-voltage characteristics of the device for a part of the second voltage sweep while the device is in the deep depletion mode;

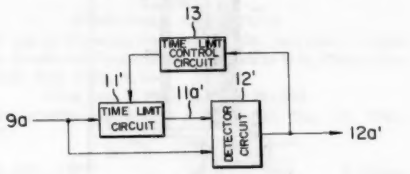
determining minority carrier generation parameters of the device in the deep depletion mode based on the capacitance-voltage characteristics determined for the first and second voltage sweeps.

4,509,013

SPEED DETECTING DEVICE

Isao Sasao, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1982, Ser. No. 442,675
Claims priority, application Japan, Mar. 3, 1982, 57-33262
Int. Cl.³ G01P *3/42, 3/56*
U.S. Cl. 324—161 **9 Claims**



1. For comparing the speed of an object relative to an automatically variable threshold value on the basis of a pulse generated each time said object moves a unit distance, a speed threshold value crossing device comprising:

a time limit circuit means for providing an output signal active for a predetermined period of time in response to said generated pulses, so that said predetermined period of time is the time limit of the time limit circuit means;

a detector circuit means supplied with the output signal of said time limit circuit means and said generated pulses, for detecting, upon receiving consecutive pulses which caused the output of said time limit circuit means to be active, whether or not the time limit of said time limit circuit means is over, and thereupon generating a detection signal indicating whether or not said object has reached a preset speed threshold value corresponding to the time limit; and

a time limit control circuit means, receiving the detection signal from said detector circuit means, for automatically varying the threshold value from the preset value by lengthening the time limit of said time limit circuit means upon receiving said detection signal indicating that the object speed has reached the preset speed threshold value.

4,509,014

NUCLEAR MAGNETIC RESONANCE GYROSCOPE

Francis A. Karwacki, Harleysville, and Joseph Griffin, Churchville, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

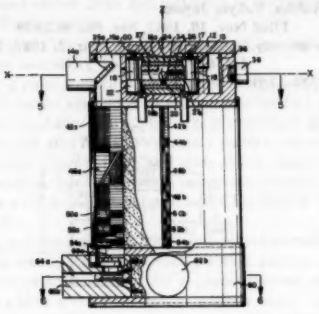
Filed Nov. 23, 1982, Ser. No. 444,001
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—305 **4 Claims**

3. Apparatus for generating a uniform magnetic field comprising, in combination:

a pair of spaced coaxial circular plates of magnetic material, each plate having a raised circular and planar surface parallel to and confronting the raised surface of the other plate forming a uniformly thicker portion about the center;

a plurality of parallel magnetic coils connected at their ends between said plates and symmetrically spaced about the thinner portion of said plates for generating a magnetic field in the space between said surfaces; and

a plurality of magnetic rods inserted in one end of respective ones of said coils, the insertion length being adjustable for



varying the flux density in the space between said surfaces to obtain a uniform magnetic field.

4,509,015

NUCLEAR MAGNETIC RESONANCE METHODS

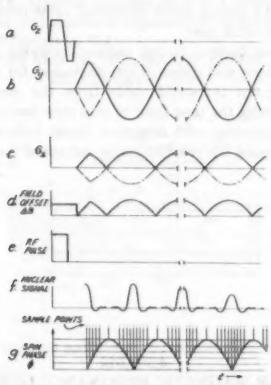
Roger J. Ordidge, 36 Brampton Dr., Stapleford, Nottingham, Nottinghamshire, and Peter Mansfield, 15 Devonshire Ave., Beeston, Nottingham, Nottinghamshire, both of England

Filed Sep. 16, 1982, Ser. No. 418,641

Claims priority, application United Kingdom, Sep. 21, 1981, 8128524

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **19 Claims**



1. A method of investigating a body by nuclear magnetic resonance comprising: preferentially exciting nuclear magnetic resonance in a slice of the body; applying for a first period a magnetic field to said body with first and second gradients in first and second directions respectively in said slice, and the first gradient subjected to a modulation such that the sense of said first gradient is periodically reversed; re-exciting said slice and re-applying said magnetic field for a second period but with the first gradient periodically reversed in sense with opposite phase to that obtaining during said first period; detecting the resultant free induction decay signals occurring during each said period of application of said magnetic field; editing the detecting signals to obtain a set of signals comprising those signals occurring when said first gradient has one sense; and processing said set of signals to retrieve data.

4,509,016

SIGNAL DETECTING CIRCUIT

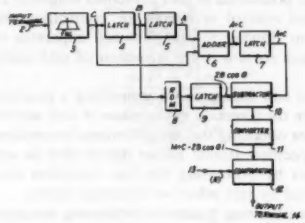
Kaichi Yamamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 315,451, Oct. 27, 1981, abandoned. This application Feb. 21, 1984, Ser. No. 581,204

Claims priority, application Japan, Oct. 29, 1980, 55-151956

Int. Cl.³ H03D *3/00*; H03K *5/22, 5/00*; H03N *9/62*

U.S. Cl. 328—138 **11 Claims**



1. A signal detecting circuit for detecting in an input signal the presence of a generally sinusoidal signal of a predetermined frequency f_p, comprising

input means for receiving said input signal;

sampling means for sampling said input signal and providing first, second, and third signal samples respectively representing the amplitude of said input signal at a first time, at a second time following said first time by a predetermined period $1/f_p$, and at a third time following said second time by said predetermined period $1/f_s$;

summing means for calculating the sum of said first and third signal samples and providing a sum signal whose value represents said sum;

calculating means for calculating 2B cos θ, where B is the amplitude of said second sampled signal and θ equals $2\pi f_p(1/f_s)$, and providing a calculated signal having a value representing 2B cos θ;

judging means for judging whether the value of said sum signal is substantially equal to the value of said calculated signal, and providing an output signal when said values are substantially equal.

4,509,017

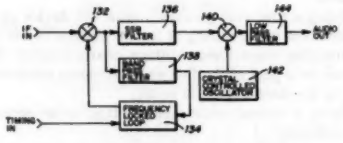
METHOD AND APPARATUS FOR PULSE ANGLE MODULATION

Carl F. Andren, Indiatlantic; William H. Mosley, Jr., St. Petersburg, and David E. Sanders, Kenneth City, all of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Division of Ser. No. 306,507, Sep. 28, 1981, Pat. No. 4,485,358. This application Feb. 15, 1984, Ser. No. 580,426

Int. Cl.³ H03D *3/00*; H04L *27/22*

U.S. Cl. 329—105 **8 Claims**



1. A method for demodulating a pulse angle modulated carrier signal having a plurality of discrete phase angles during each of a plurality of signal sampling periods, comprising the steps of:

mixing the carrier signal with a local oscillator signal to frequency translate the carrier signal to baseband;

averaging the phase angles of the baseband signal during each signal sampling period to produce a resultant signal

having an amplitude and a phase representing the vector sum of the phase angles; and

detecting the resultant signal to produce a demodulated output signal.

4,509,018

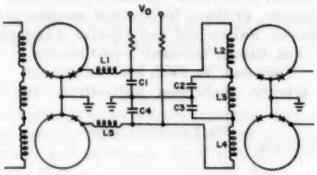
ASYMMETRIC SUPERCONDUCTING QUANTUM INTERFERENCE DEVICE IN A LINEAR AMPLIFIER CIRCUIT

Meir Gershenson, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 31, 1983, Ser. No. 480,987

Int. Cl.³ H03F *19/00*

U.S. Cl. 330—61 R **9 Claims**



1. A linear amplifier comprising:

a first superconducting quantum interference device with non-hysteretic Josephson Junctions asymmetrically interconnected for the application of direct current bias thereto; and

a second superconducting quantum interference device also with non-hysteretic Josephson Junctions asymmetrically interconnected for the application of said direct current bias thereto at an opposite asymmetry to said interconnected first superconducting quantum interference device connected to said first superconducting quantum interference device;

wherein said asymmetrically interconnected first superconducting quantum interference device which is connected to said asymmetrically second superconducting quantum interference device of opposite asymmetry combinatorially results in a combined voltage output response which is of equal deviation about zero voltage output with input applied magnetic flux.

4,509,019

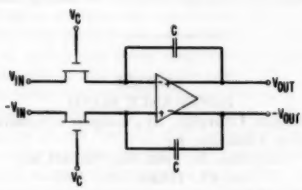
TUNABLE ACTIVE FILTER

Mihai Banu, Woodside, and Yannis Tsividis, New York, both of N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 27, 1983, Ser. No. 461,532

Int. Cl.³ H03F *3/04*

U.S. Cl. 330—107 **7 Claims**



1. A filter comprising a balanced amplifier having an inverting input and a noninverting input, and an inverted output and a noninverted output, wherein a pair of first and second input paths are connected to said inverting input and said noninverting input, respectively, and wherein a pair of first and second feedback paths are connected between said noninverted output and said inverting input, and between said inverted output and said noninverting input, respectively, and wherein at least one of said pair of paths comprises an electronically controlled resistance in the form of a field effect transistor in each of said first and second paths therein, and wherein at least the other of said pair of paths comprises a reactive element in each of said first and second paths therein.

4,509,020

PUSH-PULL AMPLIFIER

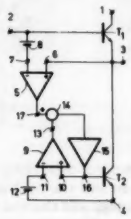
Rudy J. van de Plassche, Sunnyvale, Calif., and Eise C. Dijkmans, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1983, Ser. No. 529,892

Claims priority, application Netherlands, Sep. 22, 1982, 8203667

Int. Cl.³ H03F *3/26*

U.S. Cl. 330—274 **8 Claims**



1. A push-pull amplifier comprising a first and a second output transistor of the same conductivity type, whose collector-emitter paths are arranged in series between two power-supply terminals, the base of the first transistor being coupled to an input terminal, the emitter of one transistor and the collector of the other transistor being coupled to an output terminal, which amplifier further comprises means for maintaining the sum of the base-emitter voltages of the first and the second transistors substantially constant, characterized in that the maintaining means comprises a first measuring circuit arranged between the base and the emitter of the first transistor, which first measuring circuit comprises a first voltage-current converter, a second measuring circuit arranged between the base and the emitter of the second transistor, which second measuring circuit comprises a second voltage-current converter, a combining circuit for combining the output currents of the first and the second voltage-current converters, and a control amplifier coupled to an output of said combining circuit, said control amplifier driving the second transistor in such a way that the sum of the base-emitter voltages of the first and the second transistors remains substantially constant.

4,509,021

CIRCUIT FOR AMPLIFYING AND/OR ATTENUATING A SIGNAL

Albertus J. P. M. van Uden, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,032

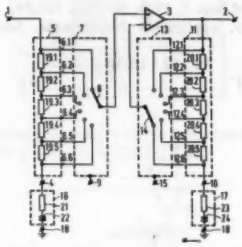
Claims priority, application Netherlands, Apr. 1, 1982, 8201376

Int. Cl.³ H03G *3/12*

U.S. Cl. 330—282 **5 Claims**

1. A circuit for amplifying and/or attenuating a signal, including an input terminal for receiving an input signal, an output terminal for supplying an output signal, and an amplifier stage, which amplifier stage includes an inverting input, a non-inverting input, an output and a controllable negative-feedback loop from the output to the inverting input thereof, the circuit further including a first voltage divider having n

taps ($n \geqq 2$) arranged between the input terminal and a first connection terminal, a first controllable switching unit for selectively coupling said n taps to the non-inverting input of said amplifier stage, a second voltage divider having m taps ($m \geqq 2$) arranged between the output terminal and a second connection terminal, and a second controllable switching unit for selectively coupling said m taps to the inverting input of said amplifier stage, said second voltage divider and said second controllable switching unit comprising said negative-feedback loop, the output of said amplifier stage being coupled to the output terminal, and the first and second connection terminals being coupled to a point of constant potential, characterized in that said first and second voltage dividers each comprises a series arrangement of a plurality of resistors, the ends of the series arrangement and the junction points of the resistors each constituting a tap, and the end of the series arrangement corresponding to the first voltage divider are coupled to the input terminal of the circuit and to the first connection terminal, respectively, and the ends of the series arrangement corresponding to the second voltage divider are coupled to the output of the amplifier stage and to the second connection terminal, respectively, and said circuit further comprises impedances connected between said connection terminals and said point of constant potential, respectively, wherein said impedances each comprises at least a capacitance arranged between the first connection terminal and the second connection terminal, respectively, and the point of constant potential.

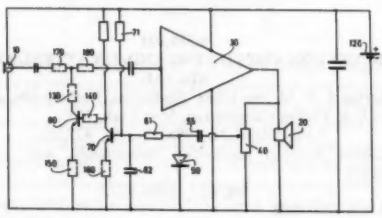


4,509,022

AMPLIFIER CIRCUIT WITH AUTOMATIC GAIN CONTROL AND HEARING AID EQUIPPED WITH SUCH A CIRCUIT

Philippe Ridel, Bois d'Ennebourg, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,745
Claims priority, application France, Mar. 1, 1982, 82 03347
Int. Cl.³ H03G *3/20*
U.S. Cl. 330—284 **15 Claims**



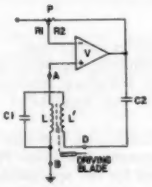
1. An amplifier circuit with automatic gain control comprising, in cascade, an input transducer, an amplifier, and an output transducer, and an automatic gain control circuit comprising a variable resistor for taking off an alternating voltage the amplitude of which varies with a signal from the input transducer, a rectifier and an RC-filter responsive to said alternating voltage, and means connecting an output of the filter to a base of a first transistor having a collector that directly drives a base of a second transistor connected to an input of the amplifier such that it attenuates an input signal of said amplifier to a greater extent as the signal across the variable resistor increases, and wherein said first and second transistors are of the same conductivity type whereby an increase in conduction of the first transistor produces a decrease in conduction of the second transistor.

4,509,023

OSCILLATOR WITH A TEMPERATURE COMPENSATED OSCILLATING COIL

Peter Heimlicher, Freiburg, Switzerland, assignor to Contrinex S.A., Matran, Switzerland and Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany, a part interest

Filed Jun. 30, 1982, Ser. No. 393,629
Claims priority, application Switzerland, Jul. 17, 1981, 4702/81
Int. Cl.³ H03L *1/02*
U.S. Cl. 331—176 **8 Claims**



8. A proximity switch comprising:

an oscillator including an oscillating circuit having an oscillating coil with a temperature dependent resistance, said oscillating circuit having a resonant frequency and a negative resistance connected across said oscillating circuit;

a constant alternating current source for supplying said oscillating circuit with current at said resonant frequency, said constant alternating current producing in the temperature dependent resistance of said oscillating coil a temperature dependent voltage drop effective to compensate for any temperature variation in the amplitude of a voltage across said oscillating circuit;

said proximity switch being responsive to a driving blade for driving said proximity switch according to a switching distance between said driving blade and said oscillating coil, said switching distance determining a switching on and off of said oscillator, and said temperature variation compensation of the voltage across the oscillating circuit providing an increased effective switching distance.

4,509,024

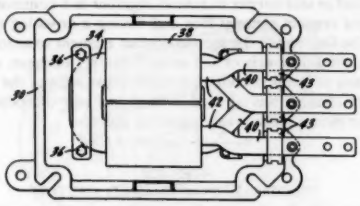
IMPEDANCE BOND

H. James Wilson, LaGrange, Ky., assignor to Safetran Systems Corporation, Louisville, Ky.

Filed Jan. 26, 1983, Ser. No. 461,105
Int. Cl.³ H03H *7/01, 7/09*
U.S. Cl. 333—24 R **4 Claims**

1. An impedance bond for use in an electrified railway to provide a path for traction current including a housing, a core within said housing, said core being formed of a band of silicon steel wound into a closed loop construction which is severed to form a cap and a U-shaped body to permit coil placement thereon, a pair of coils positioned each upon a leg of the U-shaped core, each of said coils being substantially identical in

electrical resistance and each being formed of a flat copper sheet, identical in length, and wound into coils identical in



configuration, and terminal straps attached to said coils and extending outwardly from said housing.

4,509,025

POLARIZED ELECTROMAGNETIC RELAY

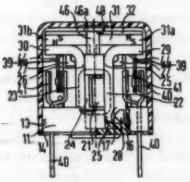
Rolf-Dieter Kimpel, Unterschweinbach; Ulf Rauterberg, and Horst Tamm, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,235

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1981, 3132244

Int. Cl.³ H01H *51/22*

U.S. Cl. 335—85 **16 Claims**



1. A polarized electromagnetic relay comprising:

a hollow coil body having a coil wound thereabout having a longitudinal coil axis;

a bar-shaped armature having a mounted end in a pivotable bearing means disposed at one end of said coil body, said armature extending through said coil body substantially along said coil axis and terminating in a free end at an opposite end of said coil body;

a quadripole permanent magnet arrangement having first and second pole pairs with opposite polarization directions perpendicular to said coil axis;

two yokes disposed in a single plane parallel to said permanent magnet arrangement, one of said yokes being magnetically coupled to a pole of said first pole pair and the other of said yokes being magnetically coupled to an opposite pole of said second pole pair;

two pole plates respectively connected to said yokes and extending perpendicular to said coil axis for effecting movement of said free end of said armature, and

a flux plate for coupling the remaining opposite poles of said first and second pole pairs to each other and to the mounted end of said armature; said flux plate having a flat segment overlapping

and spaced from said yokes and said permanent magnet arrangement being disposed in the volume defined between the flat segment and said yokes longitudinally parallel to said coil axis, and said flux plate, said yokes, and said permanent magnet arrangement therebetween disposed longitudinally overlying said coil.

4,509,026

POLARIZED ELECTROMAGNETIC RELAY

Hidetoshi Matsushita, Osaka, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan and SDS, Elektro GmbH, Munich, Fed. Rep. of Germany

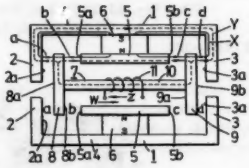
PCT No. PCT/JP82/00147, § 371 Date Dec. 29, 1982, § 102(e) Date Dec. 29, 1982, PCT Pub. No. WO82/03944, PCT Pub. Date Nov. 11, 1982

PCT Filed Apr. 30, 1982, Ser. No. 459,873

Claims priority, application Japan, Apr. 30, 1981, 56-65601; Apr. 30, 1981, 56-65602

Int. Cl.³ H01H *51/22*

U.S. Cl. 335—85 **7 Claims**



7. A polarized electromagnetic relay comprising:

a U-shaped first yoke comprising right and left lateral pieces interconnected by a longitudinal piece, said lateral pieces including mutually facing inner surfaces which define contacting pole surfaces,

a second yoke shorter than the distance between said right and left lateral pieces of said first yoke and disposed generally parallel to said longitudinal piece of said first yoke, said second yoke including right and left outer lateral surfaces which define contacting pole surfaces,

a first permanent magnet disposed between said second yoke and said longitudinal piece of said first yoke and having a magnetization axis directed generally parallel to planes defined by said lateral and longitudinal pieces of said first yoke,

a U-shaped third yoke comprising right and left lateral pieces interconnected by a longitudinal piece, said lateral pieces of said third yoke including mutually facing inner surfaces which define contacting pole surfaces,

said right and left lateral pieces of said third yoke extending toward said plane defined by said longitudinal piece of said first yoke, and said right and left lateral pieces of said first yoke extending toward a plane defined by said longitudinal piece of said third yoke,

a fourth yoke shorter than the distance between said right and left lateral pieces of said third yoke and disposed generally parallel to said longitudinal piece of said third yoke, said fourth yoke including right and left outer lateral surfaces which define contacting pole surfaces,

a second permanent magnet disposed between said fourth yoke and said longitudinal piece of said third yoke and having a magnetization axis directed generally parallel to planes defined by said lateral and longitudinal pieces of said first yoke,

an armature positioned between said second and fourth yokes and including right and left lateral pieces interconnected by a longitudinal piece, said longitudinal piece of said armature being disposed between and parallel to said second and fourth yokes, said lateral pieces of said armature each forming inner and outer contact surfaces,

said armature being longitudinally reciprocable along a longitudinal axis of said longitudinal piece of said armature such that when said armature is at either end of its reciprocable stroke:

said inner contact surface of one of said lateral pieces of said armature engages adjacent contacting pole surfaces of said second and fourth yokes, and

said outer contact surface of the other of said lateral pieces

of said armature engages adjacent contacting pole surfaces of said first and third yokes, and

a coil disposed around said longitudinal piece of said armature,

the contacting pole surfaces at one pair of adjacent ends of said second and fourth yokes are larger than the contacting pole surfaces at the other pair of adjacent ends of said second and fourth yokes.

4,509,027

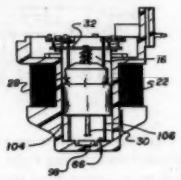
CURRENT OPERATED MINIATURE RELAY

William C. Otto, Indianapolis, Ind., and Norman E. Daugherty, Elizabethtown, Ky., assignors to E.M.B. Corporation, Elizabethtown, Ky.

Filed Sep. 23, 1982, Ser. No. 421,867

Int. Cl.³ H01H 9/30

U.S. Cl. 335—201 **6 Claims**



1. A gravity/spring assisted electrical current operated relay comprising:

(a) a relay body and a cavity therein,

(b) a magnetic coil carried by said body,

(c) an electrical contact and armature assembly slideably carried in said cavity, and

(d) anti-tracking means disposed in said cavity preventing electrically conductive paths from arc tracking over electrically insulating surfaces of said cavity including slots provided in said electrically insulating surfaces and projections extending from said electrically insulating surfaces.

4,509,028

ELECTROMAGNETIC RELAY

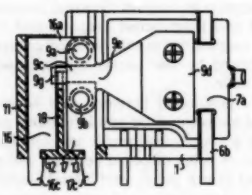
Erwin Müller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 28, 1983, Ser. No. 546,450

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, P3234360[U]

Int. Cl.³ H01H 45/02

U.S. Cl. 335—202 **6 Claims**



1. An electromagnetic relay comprising a coil body carrier supported by an angular yoke having a first leg coupled to one pole end of a coil core and a second leg forming a bearing edge for a flat armature facing across a working gap with the other pole end of the coil core, a contact spring connected to said armature and extending longitudinally thereof, said contact spring having a transverse contact bridge portion outward from said armature for engaging at least one pair of cooperating contact pieces aligned with one another in one switch position, the improvement comprising at least one pair of contact elements in the form of side-by-side planar plates mounted in said carrier to extend together in a common plane, the first contact element free end having a cross-leg directed over the free end of the second contact element so as to extend across the linear axis of the second contact element, and the free ends of the first contact element cross-leg and the second contact element having said at least one pair of cooperating contact pieces respectively mounted thereon.

4,509,029

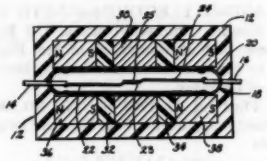
THERMALLY ACTUATED SWITCH

Fennimore N. Bradley, Muskegon, Mich., assignor to Midwest Components, Inc., Muskegon, Mich.

Filed Mar. 9, 1984, Ser. No. 588,096

Int. Cl.³ H01H 36/00

U.S. Cl. 335—208 **12 Claims**



1. A thermal switch comprising:

a cylindrical enclosure including a pair of electrical contact arms extending longitudinally inwardly from opposite ends thereof and spaced from one another, said contact arms having contacts at a free end which overlay one another in spaced relationship, said contact arms made of a ferromagnetic material;

an annular ferrite sleeve surrounding said enclosure and axially aligned with said contacts, said ferrite sleeve having a preselected Curie point temperature at which its permeability changes;

a pair of annular permanent magnets surrounding said enclosure on opposite sides of said ferrite sleeve and aligned in series aiding relationship, said magnets each spaced from an end of said sleeve a predetermined gap distance of from about 0.04 to 0.07 inches and having outer ends which generally align with the ends of said enclosure; and

means for holding said enclosure, said sleeve and said magnets in fixed relationship with respect to each other.

4,509,030

CORRECTION COIL ASSEMBLY FOR NMR MAGNETS

Mark E. Vermilyea, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 5, 1984, Ser. No. 628,076

Int. Cl.³ H01F 7/22

U.S. Cl. 335—216 **13 Claims**

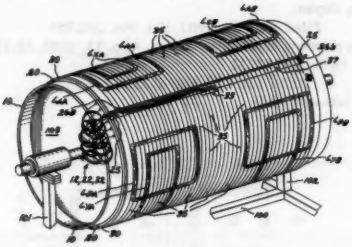
1. A correction coil assembly, especially for use in superconductive magnets and other cryogenic environments, said assembly comprising:

at least one electrical coil disposed on a first cylindrical form;

at least one transverse coil disposed on a second cylindrical coil form, said second form having a longitudinal slit therein, said second form being disposed coaxially about said first form and over said coil disposed on said first form;

an insulated, non-magnetic wire having a coefficient of thermal expansion greater than that of the material of said second coil form, said wire being tightly wrapped around

said second coil form so as to securely hold said second form against said first form under cryogenic conditions; and



a pair of insulative supports diposed at and fixed to each end of said assembly, each end of said wire being attached to a distinct one of said supports.

4,509,031

MAGNETIC ROLLER DEVICE

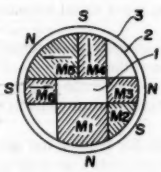
Yoshio Sakata, Kanagawa, and Yasushi Kakehashi, Shiga, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 20, 1983, Ser. No. 486,888

Claims priority, application Japan, Apr. 20, 1982, 57-65757

Int. Cl.³ H01F *7/02*

U.S. Cl. 335—306 **9 Claims**



1. A magnet roller having contacting configurations of plural magnets around a ferro-magnetic metal shaft, said magnet roller comprising: a plurality of contacting magnets disposed about a ferro-magnetic shaft, the number of which magnets corresponds to the number of magnetic poles necessary at the circumference of said magnet roller, said magnets in at least one pair of adjacent magnets having magnetically contacting portions not only through the ferro-magnetic metal shaft but also between the said shaft and the said circumference so that one magnet of at least one pair of adjacent magnets is a magnet corresponding to a necessary magnetic pole and also is an assistant magnet for an adjacent magnet, and the magnet which serves as an assistant magnet additionally is aligned so that the magnetic flux thereof has a component along the rectangular direction of the magnetized direction of the other magnet.

4,509,032

MAINS TRANSFORMER

Sieghard Post, Guntersdorf, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

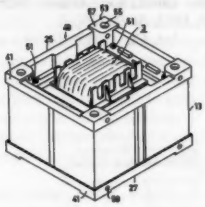
Filed Feb. 28, 1983, Ser. No. 470,653

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207606

Int. Cl.³ H01F *15/04, 27/08*

U.S. Cl. 336—59 **12 Claims**

1. A transformer comprising a ferromagnetic core having windings thereon, a metal screening sheath surrounding the core, first and second supporting caps placed on the transformer from opposite directions and between which the screening sheath is clamped at a distance from the core, the edges of the screening sheath being fixed in grooves in the



supporting caps, and wherein the grooves include lugs which extend transversely to the longitudinal direction of the grooves and into which the edges of the screening sheath penetrate thereby to locate the screening sheath in the grooves so as to be free from play.

4,509,033

IGNITION COIL CONSTRUCTION FOR ENGINE IGNITION SYSTEM

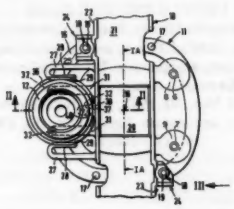
Günther Weiss, Markgröingen; Paul Wörz, and Stanislaus Tomczak, both of Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 493,961

Claims priority, application Fed. Rep. of Germany, May 12, 1982, 3217754; Mar. 19, 1983, 3309986

Int. Cl.³ H01F *27/04*

U.S. Cl. 336—107 **17 Claims**



1. Ignition coil structure, suitable for embedding in a cast insulating mass, comprising a primary coil body having a hollow leg carrying a primary coil and an iron core havng a central leg inserted into said hollow leg of said body so as to pass through said primary coil, a secondary coil body carrying a secondary coil and a high voltage terminal holder containing a connector connected to said secondary coil at least said primary coil body and said secondary coil body being held together by a snap connection produced by integral parts of said coil bodies, said integral snap connection parts of said secondary coil body comprising at least first and second studs (**18**) extending from one end face (**15**) of said secondary coil body, each having a catch tip (**19**), and said integral snap connection parts of said primary coil body including at least first and second flanges (**24**) each having a perforation (**25**), the snap connection between said bodies being provided by insertion of said studs (**18**) in said perforations (**25**) and engagement of said catch tips (**19**) of said studs (**18**) behind said flanges (**24**).

4,509,034

GAS SENSOR

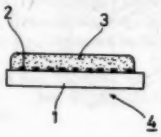
Sai Sakai, Osaka, Japan, assignor to New Cosmos Electric Col, Ltd., Japan

Filed Feb. 14, 1984, Ser. No. 579,926

Claims priority, application Japan, Mar. 22, 1983, 58-39724[U]; Jun. 28, 1983, 58-98725[U]

Int. Cl.³ G01N *27/12*

U.S. Cl. 338—34 **7 Claims**



1. A gas sensor comprising an electric resistor of noble metal and a sintered piece of a metal oxide covering the electric resistor, the sintered piece being a semiconductor, wherein the ratio of the combined resistance Ro of the resistor and the semiconductor to the resistance ro of the resistor, Ro/ro, is within the range defined by the inequality $0.45 < Ro/ro < 0.95$, wherein the electric resistor is adapted to serve as a heater and also as an electrode for detecting a decrease in the electric resistance of the semiconductor in response to gas adsorption by said semiconductor.

4,509,035

HUMIDITY-SENSITIVE ELEMENT AND PROCESS FOR PRODUCING THE SAME

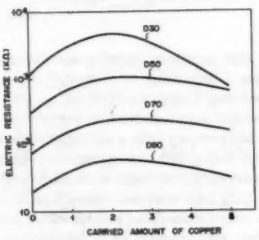
Mituo Harata; Hideaki Hiraki, both of Kawasaki; Shigeki Uno; Kazuo Sakuma, both of Tokyo, and Kiyosi Matsunaga, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 30, 1983, Ser. No. 556,598

Claims priority, application Japan, Nov. 30, 1982, 57-209605

Int. Cl.³ H01L *7/00*

U.S. Cl. 338—35 **7 Claims**



1. A humidity-sensitive element comprising:

a porous metal oxide sintered body;

a material selected from the group consisting of phosphorus, sulfur and oxides thereof, said simple material carried on said porous metal oxide sintered body; and

copper ions carried on said porous metal oxide sintered body.

4,509,036

A/D CONVERTER WITH BIT EXTENSION CAPABILITY USING WIRED-OR OUTPUTS

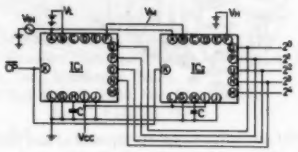
Makoto Furihata, Tachikawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,587

Claims priority, application Japan, Aug. 13, 1980, 55-110231; Aug. 13, 1980, 55-110232

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **7 Claims**



1. An integrated A/D converter comprising:

(1) comparator means for comparing a plurality of different reference voltages individually to an analog input signal and for producing a plurality of output signals as a result of said comparisons;

(2) code converter means connected to said comparator means for converting the plural output signals of said comparator means into digital signals of plural bits;

(3) critical detecting means for comparing a critical reference voltage having a level outside of the range of said plural reference voltages with the analog input signal and for producing a detection output at a predetermined level in case said analog input signal exceeds said critical reference voltage;

(4) control means responsive to external control for selectively forcibly controlling the levels of said digital signals of the plural bits to a selected level in case said detected output of said critical detecting means reaches said predetermined level;

(5) first output means for feeding out said digital signals of the plural bits of said code converter means to the plural output terminals of an integrated circuit; and

(6) second output means for feeding out the detected output of said critical detecting means to another output terminal of said integrated circuit, wherein said control means includes a control input terminal which is provided as an external terminal of said integrated circuit and means for inhibiting the forced control operation by impressing a control signal upon the control input terminal of said control means.

4,509,037

ENHANCED DELTA MODULATION ENCODER

Robert W. Harris, Ellicott City, Md., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 272,983, Jun. 12, 1981, abandoned. This application Dec. 1, 1982, Ser. No. 446,012

Int. Cl.³ H03K *13/22*

U.S. Cl. 340—347 AD **29 Claims**

1. An analog-to-digital encoder for converting an analog input signal to a digital output, comprising:

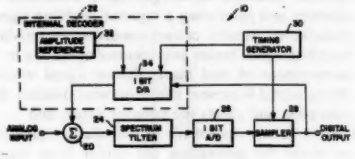
first means for receiving the analog input signal and for generating an analog dither signal;

second means, operatively connected to said first means, for receiving the analog dither signal and for generating a flattened analog signal, said second means having more than 180° of phase lag at certain frequencies, said second means including means for reducing the phase lag below 180°;

third means, operatively connected to said second means, for

receiving the flattened analog signal and for generating the digital output; and

fourth means, operatively connected to said third means and to said first means, for feeding back the digital output to



said first means by generating an internal analog signal and providing the internal analog signal to said first means, said first means adding the analog input signal and internal analog signal to obtain the analog dither signal.

4,509,038

CODE-CONVERTING SYSTEM FOR BAND COMPRESSION OF DIGITAL SIGNALS

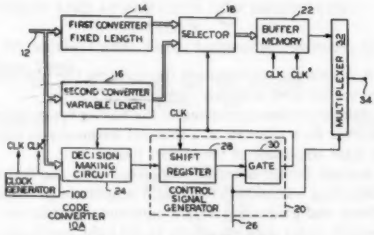
Akira Hirano, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 099,501, Dec. 3, 1979, abandoned, which is a continuation of Ser. No. 918,102, Jun. 22, 1978, abandoned. This application Feb. 18, 1983, Ser. No. 467,953

Claims priority, application Japan, Jun. 27, 1977, 52-76978

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **3 Claims**



1. A code converting system for band compression of digital signals including a code converter and a code-inverse converter, wherein:

said code converter comprises:

an input terminal for receiving an N-bit parallel input digital signal,

first converting means coupled to said input terminal for converting said input digital signal into a fixed length code selected from 2^N kinds of fixed length codes and corresponding to the signal level of said input digital signal,

second converting means coupled to said input terminal for converting said input digital signal to a variable length code selected from 2^N kinds of variable length codes and corresponding to the signal level of said input digital signal,

first selector means coupled to the outputs of said first converting means and said second converting means for selectively passing the output of one of said converting means,

first buffer memory means for storing the code supplied from said first selector and for transmitting the stored code in series and at a constant speed to a transmission channel,

first decision making circuit means coupled to said input terminal for deciding whether said input digital signal has a signal level corresponding to a first predetermined variable length code or whether said input digital signal has the signal level corresponding to a second predetermined variable length code, said decision making circuit means causing said first selector means to select between said converting means responsive to the decision which is made by the decision making circuit means,

first register means coupled to said first decision making circuit means for storing the output signal from said first decision making circuit means and for delaying said output signal by one sample period in order to form a delayed output signal which is supplied to said first selector;

said code-inverse converter comprises:

serial-to-parallel converter means for converting an output code transmitted from said code converter into a parallel code,

first inverse-converting means coupled to said serial-to-parallel converter means for inversely-converting the fixed length code given from said serial-to- parallel converter means into an input digital signal corresponding to said fixed length code,

second inverse-converting means coupled to said serial-to-parallel converter means for inverse-converting the variable length code given from said serial-to- parallel converter means into an input digital signal corresponding to said variable length code,

code-boundary detecting means coupled to said serial-to-parallel converter means for detecting the boundary between codes in said output code given from said code converter,

second decision making circuit means coupled to said serial-to-parallel converter means for deciding whether said output code from said serial-to-parallel converter means is a fixed length code or a variable length code,

second register means coupled to said second decision making circuit means for storing the output signal from said second decision making circuit means and for delaying said output signal by one sample period,

second selector means coupled to the outputs of said first inverse-converting means and said second inverse-converting means, said second selector being operated in response to an output signal means from said second register means, and

second buffer memory means connected to said second selector means for storing an output digital signal selected by said second selector in response to an output signal from said code-boundary detecting means and for reading out the resulting stored digital signal at a constant speed.

4,509,039

SHIELDED, CLOSELY SPACED TRANSMIT-RECEIVER ANTENNAS FOR ELECTRONIC ARTICLE SURVEILLANCE SYSTEM

Dean M. Dowdle, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 5, 1983, Ser. No. 510,780

Int. Cl.³ G08B *13/24*; H01Q *7/04*

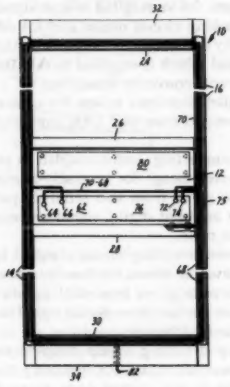
U.S. Cl. 340—572 **7 Claims**

1. For use in an electronic article surveillance system having transmitter means for providing an electromagnetic field in a predetermined area at at least one of a plurality of frequencies extending through a predetermined range of frequencies, a resonant marker circuit having at least one resonant frequency within said predetermined range of provided frequencies, and receiver means for detecting the presence of said marker circuit in said electromagnetic field and providing an alarm indication thereof, an antenna system comprising:

a transmitting antenna coupled to said transmitter means and a receiving antenna coupled to said receiver means, said antennas being disposed in a closely spaced, generally parallel relationship on one side of an exit-way along which a said marker circuit must pass for detection, said transmitting and receiving antennas each having substantially the same area and being magnetically nulled to

minimize mutual inductance, at least one of said antennas having at least two twisted loops lying in a common plane, each loop being twisted 180° to be in phase opposition with each adjacent loop; and

a conductive shield enclosing substantially all of both of the closely spaced antennas and including a discontinuity in



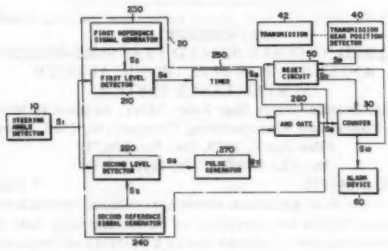
each outer portion enclosing a said twisted loop to provide a discontinuous shield for both the transmit and receive antennas to prevent external electric fields from inducing current flow in either antenna which could otherwise destroy the null created therebetween and hence adversely effect the detection of said marker circuit.

4,509,040

ALARM SYSTEM FOR PREVENTING AN AUTOMOTIVE VEHICLE DRIVER FROM DOZING AT THE WHEEL

Yasutoshi Seko, Yokohama; Masami Inoue, and Takayuki Yanagishima, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 1, 1981, Ser. No. 326,393
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—576 **19 Claims**



1. An alarm system for preventing an automotive vehicle driver from dozing while driving, comprising:

a steering angle detector for detecting angular displacement of a steering member from a neutral position and producing a first signal having a value which is proportional to the detected displacement;

a discriminator for detecting a condition wherein said first signal value exceeds a threshold value and detecting a rate of variation of the steering angular displacement higher than a predetermined value, which discriminator produces a discriminator signal when said first signal value exceeds said threshold value and said rate of variation is higher than said predetermined value;

a counter for counting occurrences of said discriminator signal and producing an alarm signal when the counted value reaches a preset value;

a counter enabling signal generator associated with said counter and producing a counter enabling signal while a preselected steady cruise condition is satisfied, which enabling signal makes said counter operative to count said occurrences of said discriminator signal while said enabling signal is present and otherwise disables the counter operation and clears the counter value; and

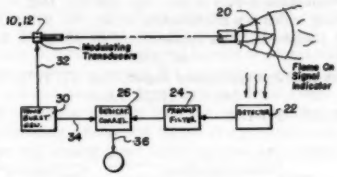
an alarm device responsive to said alarm signal to produce an alarm for preventing the driver from dozing at the wheel.

4,509,041

CORRELATION TYPE FLICKER FLAMON

Marion A. Keyes, Chagrin Falls, and William L. Thompson, Chardon, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 22, 1982, Ser. No. 360,861
Int. Cl.³ G08B *17/12, 21/00*
U.S. Cl. 340—578 **4 Claims**



1. A device for continuously determining the presence of a flame emitted from a burner comprising:

modulation means connected to the burner for modulating a burner flow pressure at a selected frequency to modulate a light amplitude of the burner flame;

an optical flicker detector associated with the burner for detecting variations in the light amplitude of the burner flame and generating a light amplitude modulation signal which varies with variations in the light amplitude of the flame;

correlator means connected to said optical flicker detector for generating a flame on signal when correlation is established between the selected frequency of said modulation means and said light amplitude modulation signal; and

said modulation means comprising a tone burst generator for modulating the burner flow pressure at said selected frequency in bursts with said correlator means being operable to detect the termination of each burst and detect a corresponding termination in said light amplitude modulation signal to maintain said flame on signal.

4,509,042

PORTAL RADIATION MONITOR

Lyle W. Kruse, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 23, 1982, Ser. No. 361,152
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—600 **8 Claims**

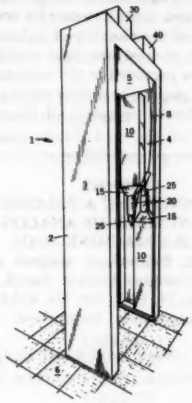
1. A portal radiation monitor comprising:

a portal having spaced opposed sides defining an opening therebetween;

scintillator means connected to said sides for detecting radiation within said opening;

means for converting scintillations from said scintillator means into electrical pulses;

pulse-shape discriminator means for producing only output pulses corresponding to pulses from said converting



means having a predetermined rise time indicative of a radiation event;

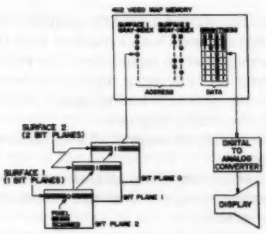
alarm means for indicating the presence of radiation at the monitor when the count rate of pulses from said discrimination exceeds a predetermined level.

4,509,043

METHOD AND APPARATUS FOR DISPLAYING IMAGES

Paula X. Mossaides, Canby, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 12, 1982, Ser. No. 367,659
Int. Cl.³ G09G 1/16
U.S. Cl. 340—721 **3 Claims**



1. Graphic display apparatus for producing a plurality of images to be independently displayed and for superimposing said plurality of images onto one another to produce a composite image on a display, comprising:

a plurality of individual storage area means, each of said storage area means storing a plurality of bits therein, each corresponding bit in each of the plurality of storage are means being associated with a pixel point on said display;

first interactive means for user subdivision of said plurality of storage area means into a plurality of groups of storage areas and for user designation of at least one of said groups to be displayed to form a composite image, each group of storage areas corresponding to an image, the number of said plurality of groups of storage areas corresponding to the maximum number of said plurality of images which may be displayed on said display, the digital condition of the bits in each of said plurality of groups of storage areas defining the particular image stored therein;

further storage means for storing a plurality of initial brightness indices therein for each of said plurality of groups of storage areas, each of the initial brightness indices determining the brightness of the image of the corresponding storage area group, said further storage means storing a plurality of columns of bits therein, the number of columns of bits corresponding to the number of groups of storage areas, each of said initial brightness indices corresponding to at least one bit in each of the plurality of columns;

scanning means for scanning said plurality of groups of storage areas to determine the digital condition of the bits in each of said plurality of groups for each pixel point on said display, the located bit in each group being representative of the image from that group to be displayed at the selected pixel point;

locating means responsive to the scanning performed by the scanning mean for locating at least one bit in each of the plurality of columns of bits in said further storage means corresponding to the located bit in each of said plurality of groups of storage areas, the locating mean determining a said initial brightness index corresponding to the located bits in each of the plurality of columns of bits in said further storage means; and

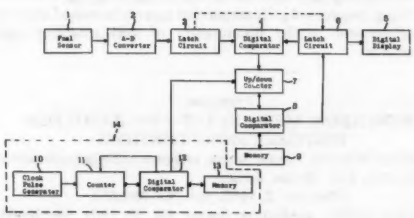
means for converting the initial brightness index determined by the locating means into an electrical signal, said electrical signal determining the brightness of said composite image at each of the pixel points on said display.

4,509,044

DEVICE WHICH ACCURATELY DISPLAYS CHANGES IN A QUANTITY TO BE MEASURED

Yoichi Yachida, Nagaoka, Japan, assignor to Nippon Seiki Kabushiki Kaisha, Nigata, Japan

Filed May 7, 1982, Ser. No. 376,237
Claims priority, application Japan, May 13, 1981, 56-71919; Jun. 9, 1981, 56-89110
Int. Cl.³ G09G 3/00
U.S. Cl. 340—789 **4 Claims**



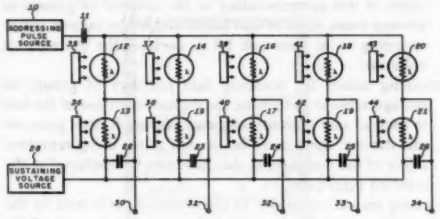
1. A display device comprising: means for displaying display data; sampling means for periodically sampling digital signals corresponding to changes in a quantity to be measured; comparing means for comparing sampling data from said sampling means with said display data to generate a difference signal; accumulating means for accumulating the difference signal generated by said comparing means to output an accumulation signal; and discriminating means for discriminating a large or small relation between the accumulation signal from said accumulating means and a predetermined value, said discriminating means further producing an output signal to update said display data according to said sampling data when said discriminating means discriminates that the accumulation signal has exceeded the predetermined value.

4,509,045

LOW COST ADDRESSING SYSTEM FOR AC PLASMA PANELS

Claude D. Lustig, Lexington, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,364
Int. Cl.[3] G09G 3/00
U.S. Cl. 340—794 6 Claims



1. An improved flat panel display of the type having an AC plasma display panel with individual display lines therein comprising:

means for providing addressing pulse signals;

a plurality of coupling photoresistors coupled to said addressing pulse means;

a plurality of decoupling photoresistors, each of said decoupling photoresistors coupled to a corresponding one of said plurality of coupling photoresistors;

a plurality of shunt capacitors coupled in shunt relationship with a corresponding one of said decoupling photoresistors;

a sustaining voltage source means coupled to said decoupling photoresistors for providing sustaining voltage pulses in synchronism with said addressing pulses;

a plurality of output terminals coupled to the junction of said coupling and decoupling photoresistors and said shunt capacitors, each of said output terminals being coupled to a one of said AC plasma panel display lines;

means including a plurality of coupling light sources for selectively illuminating in a one to one correspondence said plurality of coupling photoresistors substantially in synchronism with said addressing pulses; and

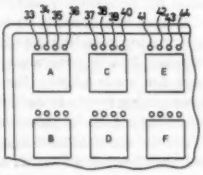
a plurality of decoupling light sources for selectively illuminating in a one to one correspondence said plurality of decoupling photoresistors; said decoupling light sources being respectively illuminated at a predetermined interval subsequent to the illumination of said coupling light sources.

4,509,046

INDICATING METHOD AND APPARATUS FOR DIGITIZER MENU PORTIONS

Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jul. 2, 1982, Ser. No. 394,652
Claims priority, application Japan, Jul. 30, 1981, 56-120403
Int. Cl.[3] G09G 3/00
U.S. Cl. 340—815.1 2 Claims



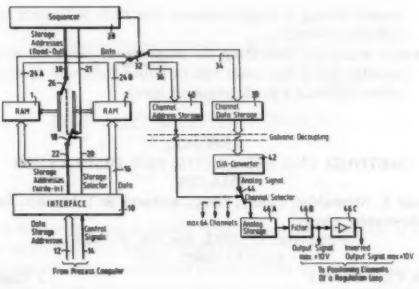
1. Digitizer apparatus comprising a menu element having a face divided into a plurality of blocks, each block being responsive to activation by an operator to produce a corresponding command signal for control of a data processing device having a plurality of modes of operation, a plurality of cells positioned behind the face, each cell corresponding to one of the plurality of blocks, a plurality of light sources of different colors associated with each cell, and control means for controlling of the illumination of each of the plurality of light sources so as to selectively illuminate at least one light source to indicate a command signal to be provided in the next step in a series of sequential processing steps to be carried out in a selected one of the plurality of modes of operation of the data processing device.

4,509,047

CIRCUIT FOR CONNECTING A PROCESS COMPUTER BY MEANS OF A NUMBER OF ANALOG CHANNELS WITH A MACHINE TOOL

Fritz Rhyner, Zurich, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Zurich, Switzerland

Filed Sep. 24, 1982, Ser. No. 423,192
Claims priority, application Switzerland, Oct. 2, 1981, 6339/81
Int. Cl.[3] H04Q 9/00; G06F 15/46
U.S. Cl. 340—825.23 7 Claims



1. A circuit for connecting a process computer by means of a number of analog channels with a machine tool, comprising:

an interface arranged at an input side of the circuit;

a D/A-converter for converting digital data received from the process computer into analog signals which are to be delivered to the analog channels;

a sequencer for multiplex control of a signal output to the analog channels;

each analog channel containing an analog storage;

two random-access memories arranged in circuit with and after said interface;

a storage address line and a data bus cooperating with said interface;

a further storage address line cooperating with said sequencer;

a further data bus cooperating with said random-access memories;

two reversing switches, defining first and second reversing switches, operatively connected with said interface and said sequencer and which can be set in opposition with respect to one another for connecting one of the random-access memories with the interface by means of said storage address line for writing-in 8-bit data by means of said data bus into said one random-access memory and for operatively connecting the other random-access memory by means of said further storage address line with the sequencer for reading-out data by means of said further data bus out of the other random-access memory and vice versa;

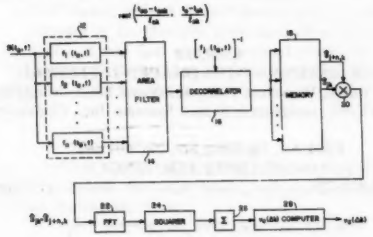
a third reversing switch which can be selectively set by said sequencer;
a channel data storage connected with the D/A-converter;
a channel address storage;
said third reversing switch alternately connecting the further data bus with the channel data storage connected with the D/A-converter and the channel address storage;
a channel selector switch operatively connected with the D/A-converter;
said channel selector switch being settable by means of the channel address storage; and
said channel selector switch serving for switching the D/A-converter to the individual analog channels.

4,509,048

METHOD AND APPARATUS FOR ΔK SYNTHETIC APERTURE RADAR MEASUREMENT OF OCEAN CURRENT

Atul Jain, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 18, 1982, Ser. No. 359,382
Int. Cl.³ G01S *13/90*
U.S. Cl. 343—5 CM **4 Claims**



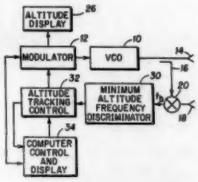
1. A method for measurement of ocean current using a chirped synthetic aperture radar which transmits periodic pulses of predetermined chirp bandwidth toward the ocean at an angle β that is the complement of the Bragg angle θ, and receives return signals, $S(t_a,t)$, comprising the steps of
compressing said signals $S(t_a,t)$ to provide signals $e_f(t_{ao},t_o)$ for different sections of said bandwidth,
selecting a small common area for separate image fields at the different sections of said bandwidth in the signals $e_f(t_{ao},t_o)$ to produce image signals $e_{jk}(t_{ao},t_o)$ for the common area,
deconvolving the signals $e_{jk}(t_{ao},t_o)$ to produce different signals for the different frequencies of said bandwidth, but of the same common area,
producing a signal $s_{jk}{\cdot}s_{j+n,k}$ that is a product of pairs of signals from the previous step,
Fourier transforming and squaring the signal thus obtained from the preceding step to produce a spectrum,
determining the Doppler shift f_D of the spectrum peak from the center of said spectrum, and
comparing said Doppler shift f_D to the Doppler shift expected due to the phase velocity v_p of the Bragg scattering wave to obtain ocean current velocity $v_c(\Delta k)$ from the difference between the expected Doppler phase shift and the determined Doppler phase shift.

4,509,049

FMCW SYSTEM FOR PROVIDING SEARCH-WHILE-TRACK FUNCTIONS AND ALTITUDE RATE DETERMINATION

Richard S. Haendel, Iowa City, and John C. Wauer, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 26, 1982, Ser. No. 401,801
Int. Cl.³ G01S *13/32*
U.S. Cl. 343—7.5 **13 Claims**



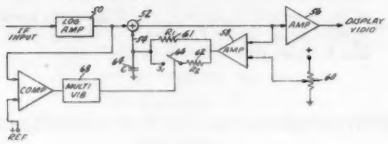
1. A distance measuring apparatus comprising:
means for providing a modulating signal having an upsweep and a downsweep;
means responsive to said modulating signal for generating a variable frequency signal;
means for transmitting said variable frequency signal to a target;
means for receiving a return spectrum of said variable frequency signal reflected from said target; and
means response to said return spectrum for controlling said modulating signal for tracking distance to target independently on both said upsweep and said downsweep.

4,509,050

AUTOMATIC ADAPTIVE SENSITIVITY TIME CONTROL FOR A GROUND MAPPING RADAR

Salvatore Amoroso, Jr., Fairfield, and Russell W. Conklin, Stratford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 30, 1982, Ser. No. 413,007
Int. Cl.³ G01S *7/34*
U.S. Cl. 343—5 SM **4 Claims**



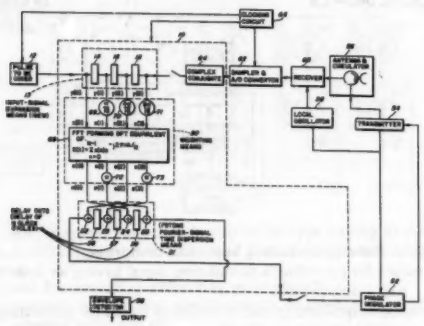
1. An adaptive sensitivity time control for a radar system employing a video display, comprising:
a log IF amplifier means for receiving radar return signals in a radar system;
a limit amplifier connected to said log IF amplifier for providing an output signal to a video display, said output signal having a range related to the available contrast in said video display; and
a feedback loop for sensing the input to said limit amplifier for providing a feedback to a node between said log IF amplifier and said limit amplifier for adjusting the clutter level of radar returns out of said limit amplifier so that the nominal clutter level of close-in radar return signals does not exceed a predetermined magnitude.

4,509,051

PHASE-CODED PULSE EXPANDER-COMPRESSOR

Bernard L. Lewis, Fort Washington, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 20, 1982, Ser. No. 420,209
Int. Cl.³ G01S *13/28*
U.S. Cl. 343—17.2 PC **9 Claims**



1. In a digital pulse expander-compressor,

input-signal expansion means responsive to an applied pulse for successively generating N replicas y(n) of the pulse, where n=0,1,2. . . . , N−1 and N is an integer, in a time which is N times the length of the pulse;

weighting means connected to the input-signal expansion means and having N output terminals for weighting the replicas y(n) in accordance with the formula

$$z(k) = \sum_{n=0}^{N-1} y(n) e^{-j\pi(k + \frac{2nk}{N} + \frac{n^2}{N2})}$$

where k=0,1,2, . . . , N−1, to provide N weighted pulses z(k), each at a respective one of the N output terminals, whenever one of the N replicas y(n) is generated; and

time-dispersion means connected to the weighting means for delaying each of the N weighted pulses z(k) corresponding to any replica of the applied pulse by a time which is determined by cyclically permutating, R/2 times, the values of k assigned to the N weighted pulses, and then multiplying the newly assigned value of k of said each one of the N weighted pulses z(k) by N times the length of the applied pulse, where R equals N if N is an even integer, and R equals (N−1) if N is an odd integer.

4,509,052

RF INTERFEROMETER/DOPPLER TARGET LOCATION SYSTEM

Carlton H. Cash, Marietta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Filed Apr. 27, 1983, Ser. No. 489,101
Int. Cl.³ G01S *5/02*
U.S. Cl. 343—418 **16 Claims**

1. A target location system, having a combination of an RF interferometer and doppler receiver, comprising:

a source for generating an RF signal;

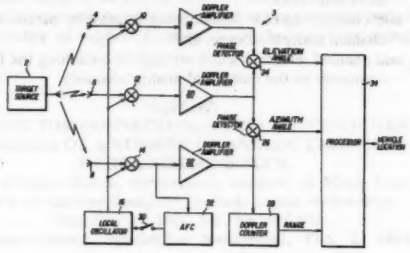
receiver circuit means for receiving said RF signal and generating a first signal representing the elevation angle of one of said source and said receiver circuit means, a second signal representing the azimuth angle of one of said source and said receiver circuit means and a third signal representing the range of one of said source and said receiver circuit means;

at least three antennas;

at least three mixer circuits, each said mixer circuits connected to a respective antenna;

an oscillator, connected to each of said mixer circuits, for heterodyning the signals from said antennas;

at least first, second and third doppler amplifiers, each said doppler amplifier connected to a respective mixer circuit for amplifying the signal from a respective mixer circuit;



a first phase detector, connected to said first and second doppler amplifiers, for generating said first signal;

a second phase detector, connected to said second and third doppler amplifiers, for generating said second signal;

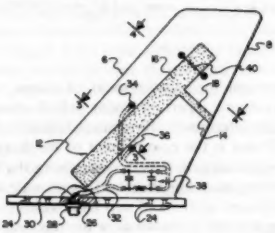
a doppler counter means, connected to said third doppler amplifier, for generating said third signal.

4,509,053

BLADE ANTENNA WITH SHAPED DIELECTRIC

Seymour Robin, Woodland Hills, and Yosef Klein, Northridge, both of Calif., assignors to Sensor Systems, Inc., Chatsworth, Calif.

Filed Jul. 26, 1982, Ser. No. 401,867
Int. Cl.³ H01Q *1/28, 13/10*
U.S. Cl. 343—708 **17 Claims**



1. An antenna having a predetermined resonant frequency for high speed craft, comprising:

a blade-like member having a base portion, a leading edge and a trailing edge,

a dielectric material disposed within the blade-like member in a radiating slot, a first section of said dielectric material extending generally longitudinally along the member, and a second section of said material extending generally transversely to the first section from an intermediate location thereon which is spaced inwardly from the ends of the first section, the location of the second section relative to the first section being selected to establish said predetermined resonant frequency, and

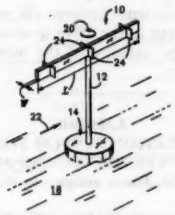
means for feeding a radiating signal to said dielectric material.

4,509,054

ANTI-STALLING ROTATING ANTENNA BUOY SYSTEM USING WIND DEFLECTING PLATES

George K. Gardiner, and Dean E. Norris, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 3, 1982, Ser. No. 446,735
Int. Cl.[3] H01Q 1/34
U.S. Cl. 343—709 17 Claims



1. An anti-stalling, rotating antenna buoy system, for use in the presence of a directed movement of air capable of inducing a rotational moment on a rotating antenna, comprising:

a buoy;

a rotating antenna having a first side with a first length, having a second side with a second length, having a major axis between said first side and said second side and being rotatably coupled to said buoy;

first means, affixed to said first side, for distributing pressure of the directed movement of air, and

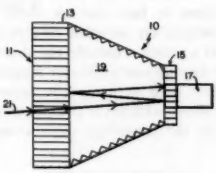
second means, affixed to said second side, for distributing pressure of the directed movement of air so that by the action of said first and said second means the rotational moment on the rotating antenna due to the directed movement of air is reduced.

4,509,055

BLOCKAGE-FREE SPACE FED ANTENNA

Matthew Fassett, Billerica, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 30, 1982, Ser. No. 431,899
Int. Cl.[3] H01Q 3/46
U.S. Cl. 343—754 5 Claims



1. A space fed antenna comprising:

(a) a first planar array of vertically-polarized antenna elements having a predetermined focal length;

(b) a second planar array of pairs of cross-polarized antenna elements parallel to the first planar array at a distance equal to one-third the focal length of the first planar array, such second planar array having peripherally located pairs of elements and centrally located pairs of elements; and

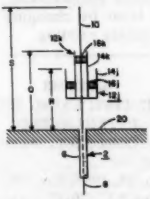
(c) means for connecting the elements in each one of the pairs of cross-polarized antenna elements to form a polarization-twisting screen from the peripherally located ones of such pairs and a combined polarization-twisting array and feed from the centrally located ones of such pairs.

4,509,056

MULTI-FREQUENCY ANTENNA EMPLOYING TUNED SLEEVE CHOKES

George Ploussios, 4 Hackney Cir., Andover, Mass. 01810

Filed Nov. 24, 1982, Ser. No. 444,493
Int. Cl.[3] H01Q 9/40
U.S. Cl. 343—791 6 Claims



1. A multi-frequency antenna system capable of efficient operation at a plurality of frequencies comprising

a feedline having a predetermined feedpoint,

a first radiating section resonant at a first operating frequency including

a coaxial choke assembly having

an inner conductor connected to said feedline, and

an outer conductive cylindrical shell surrounding and spaced from said inner conductor and having an open end and a closed end, said closed end being connected electrically to said feedline, the open end of said shell being directed away from said feedpoint and defining one end of said first radiating section and arranged so that said shell forms an active radiating element of said first section at said first operating frequency,

dielectric material partially filling said space between said outer shell and said inner conductor and being adjusted to cause the inner length of said choke assembly to be precisely one-quarter wavelength at said first operating frequency, and

a second radiating section including

said first radiating section, and

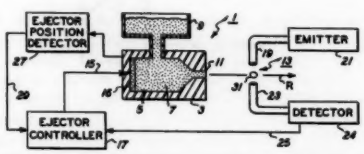
an additional element formed by an extension of said inner conductor and extending beyond the open end of said choke, said second radiating section being resonant at a second operating frequency lower than said first frequency.

4,509,057

AUTOMATIC CALIBRATION OF DROP-ON-DEMAND INK JET EJECTOR

Gordon Sohl, Richardson; Donald L. Ort, Dallas, and John R. Leicht, Bedford, all of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1983, Ser. No. 468,834
Int. Cl.[3] G01D 18/00
U.S. Cl. 346—1.1 2 Claims



1. A method for calibrating a scanning carriage drop-on-demand ink jet ejector which comprises:

(a) providing a droplet detection zone, including a droplet detector, for generating a droplet detector output signal in response to droplet traverse through said detection zone;

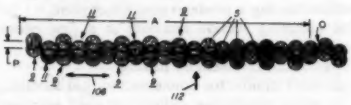
(b) providing an ejector position detector for generating an ejector position output signal in response to ejector position;
(c) moving said ejector past said detection zone while ejecting droplets from said ejector toward said detection zone;
(d) analyzing said droplet detector output signal and said ejector position output signal to determine whether an error exists in ejector position; and
(e) correcting the error by changing the time of droplet ejection during ejector printing.

4,509,058

INK JET PRINTING USING HORIZONTAL INTERLACING

Kenneth H. Fischbeck, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 22, 1983, Ser. No. 534,952
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—1.1 **1 Claim**



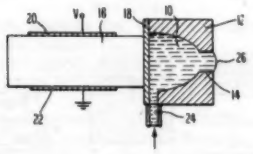
1. A method of printing on an image-receiving surface using an oscillating bar ink jet printer, which comprises:
(a) advancing said image-receiving surface at a substantially constant rate in a first direction,
(b) oscillating said bar in a direction substantially at a right angle to said first direction,
(c) expelling droplets from the oscillating bar as it moves from left to right to form a first row of droplets on said image-receiving surface,
(d) expelling droplets from the oscillating bar as it moves from right to left to form a second row of droplets,
(e) repeating steps (c) and (d) at least once, wherein
the rows of droplets formed during oscillating bar movement from left to right form a first set of columns, and the rows of droplets formed during oscillating bar movement from right to left form a second set of columns and wherein said first and said second sets of columns are interlaced on said image-receiving surface in a direction substantially at a right angle to said first direction.

4,509,059

METHOD OF OPERATING AN INK JET

Stuart D. Howkins, Ridgefield, Conn., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 1, 1982, Ser. No. 384,131
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—1.1 **36 Claims**



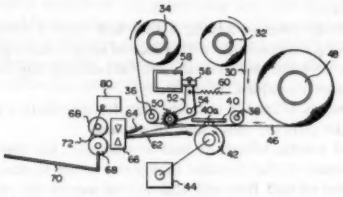
1. A method of operating a demand ink jet comprising a variable volume chamber, a transducer coupled to the chamber for varying the volume of the chamber and an ink droplet ejection orifice communicating with the chamber, said method comprising:
applying a drive level to said transducer so as to permit filling of said chamber and the formation of a meniscus at the orifice, said drive level expanding the volume of said chamber to a volume larger than the volume of said chamber when the transducer is in the quiescent state;
creating a perturbation in the drive level applied after filling has been initiated so as to move the meniscus away from the chamber in response to the perturbation;
substantially changing the drive level applied to the transducer immediately after the perturbation so as to eject a droplet from said orifice; and
controlling the time lapse between the perturbation and the substantial change in the drive level so as to control the position and the velocity of the meniscus immediately prior to ejection.

4,509,060

SHEET SEPARATION SYSTEM FOR THERMAL TRANSFER TYPE RECORDING APPARATUS

Osamu Uozumi, Zushi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 525,380
Claims priority, application Japan, Aug. 25, 1982, 57-147296
Int. Cl.³ G01D *15/10, 15/24;* **B65H** *3/22*
U.S. Cl. 346—76 PH **10 Claims**



1. In a thermal transfer type recording apparatus having a thermal head located in a predetermined position where the thermal head faces a predetermined path along which a recording sheet and an ink sheet move in contact with each other, the thermal head selectively heating the ink sheet in response to video information to thermally transfer ink from the ink sheet to the recording sheet in order to produce the video information on the recording sheet, a system for separating the recording sheet from the ink sheet after the thermal transfer of video information, comprising:
separator means located in said sheet path downstream of the thermal head to face the ink sheet, said separator means being selectively movable to a position inside the sheet path and a position outside the sheet path; and
drive means for driving said separator means to the position inside the sheet path to cause the separator means to pierce the ink sheet, which is in contact with the recording sheet, and urge the recording sheet away from the ink sheet.

4,509,061

METHOD AND APPARATUS FOR FORMING PHOTOGRAPHIC RECORD OF SOUND FIELD

Sadao Nomoto, Kamakura, and Kazuyoshi Iida, Yokohama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

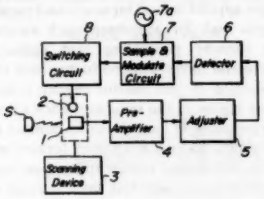
Filed Sep. 30, 1983, Ser. No. 537,610
Claims priority, application Japan, Oct. 1, 1982, 57-172698
Int. Cl.³ G01D *9/42*
U.S. Cl. 346—107 R **14 Claims**

1. A method of making a photographic record of a sound field comprising
scanning a sound field to be recorded by means of an acoustic-electric transducing means to derive a signal representing sound pressure at respective scanning points;
detecting said signal to produce an envelope signal;

sampling said envelope signal at a predetermined sampling frequency to produce a sample signal;

amplitude-modulating a carrier having a predetermined frequency with said sample signal to produce a modulated signal;

driving an electric-light transducing means for producing a light spot moving in synchronism with the movement of



said acoustic-electric converting means, with said modulated signal in such a manner that when an amplitude of the modulated signal exceeds a predetermined threshold level, said light spot is periodically turned on and off at a rate of said predetermined frequency of the carrier; and

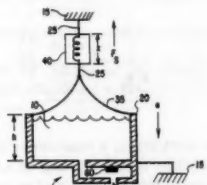
recording an image of a locus of the moving light spot on a photographic film.

4,509,062

INK RESERVOIR WITH ESSENTIALLY CONSTANT NEGATIVE BACK PRESSURE

Robert N. Low; Frank L. Cloutier, Corvallis, and Gary Siewell, Albany, all of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 23, 1982, Ser. No. 443,973
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—140 R **8 Claims**



1. A reservoir for holding a liquid for a liquid jet apparatus, said reservoir comprising:

a support structure;

a bladder supported by said support structure; and

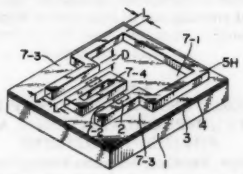
first means coupled to said support structure and said bladder for providing a negative pressure force to said liquid in said reservoir, said first means comprising a non-linear spring having an essentially constant spring force over a change in position of said bladder as the liquid in said reservoir goes from full to empty.

4,509,063

INK JET RECORDING HEAD WITH DELAMINATING FEATURE

Hiroshi Sugitani, Machida; Tadayoshi Inamoto, and Masami Yokota, both of Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 514,591
Claims priority, application Japan, Jul. 26, 1982, 57-128867
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—140 R **2 Claims**



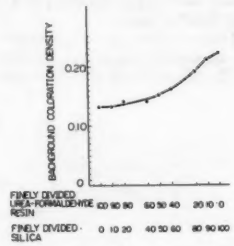
1. An ink jet recording head made by laminating on a substrate a cured photosensitive resin film for forming ink pathways on said substrate and a cover of said pathways, characterized in that the wall thickness of said ink pathways formed by said cured photosensitive resin film is not more than 15 times the film thickness of said cured photosensitive resin film.

4,509,064

HEAT-SENSITIVE RECORDING PAPER AND FILLER THEREFOR

Koichi Usui; Masahide Ogawa, both of Shibata; Kunio Goto, Nakajo; Teiji Sato; Masanori Tanaka, both of Shibata; Seikichi Takahashi, Nakajo; Kinichi Ono, Kurokawa, and Seiji Kojima, Nakajo, all of Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Osaka, Japan

Filed Jan. 27, 1984, Ser. No. 574,574
Claims priority, application Japan, Sep. 13, 1983, 58-167474
Int. Cl.³ B41M *5/18*
U.S. Cl. 346—207 **2 Claims**



1. A heat-sensitive recording paper comprising a paper substrate and a heat-sensitive recording layer formed on the paper substrate, which comprises a composition formed by dispersing in a binder a coloring agent composed of a leuco dye, a color developer composed of a heat-fusible phenol and an inorganic filler, wherein the inorganic filler comprises finely divided amorphous silica having a BET specific surface area of 10 to 100 m^2/g and a bulk density of 0.14 to 0.30 g/cc, said finely divided amorphous silica having such a secondary particle size distribution that secondary particles having a size smaller than 4 microns, as measured by the centrifugal precipitation method, occupy at least 90% by weight of the total particles.

4,509,065

RECORD MATERIAL

Kenneth J. Shanton, Beaconsfield, England, assignor to The Wiggins Teape Group Limited, Hampshire, England

Filed Nov. 18, 1982, Ser. No. 442,565

Claims priority, application United Kingdom, Dec. 4, 1981, 8136583; Dec. 4, 1981, 8136584; Dec. 9, 1981, 8137069; Dec. 9, 1981, 8137070; Dec. 9, 1981, 8137071; Dec. 9, 1981, 8137073

Int. Cl.[3] B41M 5/16, 5/18, 5/22

U.S. Cl. 346—225 4 Claims

1. Record material carrying a colour developer composition which comprises a particulate composite having as components hydrated zirconia and at least one of hydrated silica and hydrated alumina.

4,509,066

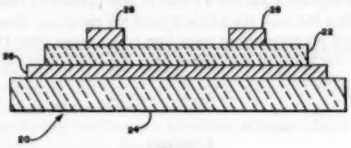
SPUTTERED SEMICONDUCTING FILMS OF CATENATED PHOSPHORUS MATERIAL AND DEVICES FORMED THEREFROM

Rozalie Schachter, Flushing; Marcello Viscogliosi, North Tarrytown, and Lewis A. Bunz, Peekskill, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 29, 1983, Ser. No. 509,175

Int. Cl.[3] H01L 49/02; C23C 15/00

U.S. Cl. 357—2 40 Claims



36. A diode comprising a semiconducting film of MP_x, where M is an alkali metal and x is equal to or greater than 15, incorporating a metal dopant having unfilled d or f orbitals, said film formed by sputtering.

4,509,067

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES WITH PROTECTIVE MEANS AGAINST OVERVOLTAGES

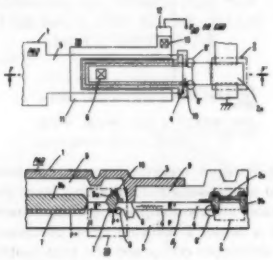
Kenji Minami, Kawasaki; Masaru Katagiri, and Hideo Noguchi, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 3, 1982, Ser. No. 354,397

Claims priority, application Japan, Jun. 23, 1981, 56-96887

Int. Cl.[3] H01L 29/90, 29/78, 27/02

U.S. Cl. 357—13 4 Claims



1. A semiconductor integrated circuit comprising:

a semiconductor substrate of a first conductivity type of a given impurity concentration;

an active semiconductor element formed in said substrate;

a protective resistor region of a second conductivity type opposite to said first conductivity type formed in the surface of the substrate, said protective resistor region being electrically connected to said active element;

an input contact portion in said resistor region for connecting an input signal to said resistor region; and

protective means including a metal oxide semiconductor field effect transistor formed to substantially surround said resistor region and electrically connected to said resistor region for being rendered conductive only by excessive voltage surges applied to said input contact portion of said resistor region and for absorbing such excess voltage surges and thereby protecting said active element; wherein said metal oxide semiconductor field effect transistor is comprised of said resistor region; a second conductivity type region in the semiconductor substrate substantially surrounding at least the input contact portion of said resistor region; an insulating layer formed adjacent to and insulating said second conductivity type region from said resistor region; a conducting layer formed at least in part on the insulating layer and extending over at least a part of said resistor region; and a channel stopper region of said first conductivity type having a higher impurity concentration than said substrate and located below and in contact with said insulating layer.

4,509,068

THYRISTOR WITH CONTROLLABLE EMITTER SHORT CIRCUITS AND TRIGGER AMPLIFICATION

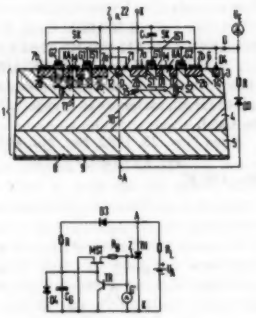
Michael Stoisiek, Ottobrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 413,122

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138762

Int. Cl.[3] H01L 29/74

U.S. Cl. 357—38 7 Claims

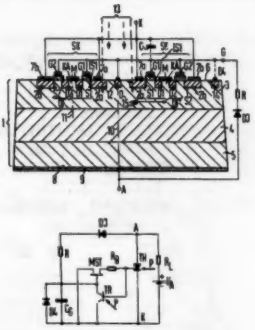


1. A thyristor comprising a semiconductor body having an n-emitter contacted by a cathode, and an adjacent p-base, and a p-emitter contacted by an anode, and an adjacent n-base, and with a plurality of emitter short circuits disposed at a boundary surface of the semiconductor body comprising MIS transistors, each MIS transistor comprising an edge region of the n(p)-emitter, a n(p)-conductive semiconductor region inserted in the p(n)-base and conductively connected thereto, and a region of the p(n)-base covered by a gate, a lateral transistor provided at the boundary surface, said lateral transistor comprising an edge region of the n(p)-emitter, a further n(p)-conductive semiconductor region inserted in the p(n)-base and connected to the gates of the MIS transistors, and comprising a sub-region of the p(n)-base lying therebetween; said sub-region having a trigger electrode; and means for connecting the gates of the MIS transistors to a positive voltage.

4,509,069
LIGHT TRIGGERABLE THYRISTOR WITH CONTROLLABLE EMITTER-SHORT CIRCUIT AND TRIGGER AMPLIFICATION

Michael Stoisiek, Ottobrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 9, 1982, Ser. No. 416,333
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138763
Int. Cl.³ H01L *29/74*
U.S. Cl. 357—38 **5 Claims**

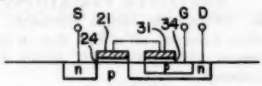


1. A light-triggerable thyristor having a semiconductor body with an n-emitter contacted by a cathode, an adjacent p-base, a p-emitter contacted by an anode, and an adjacent n-base, a plurality of emitter short circuits disposed at one boundary surface of the semiconductor body in the form of MIS transistors, each MIS transistor comprising an edge region of the n(p)-emitter, an n(p)-conductive semiconductor region inserted into the p(n)-base covered by a gate, a lateral transistor provided at the light-irridatcd boundary surface, said lateral transistor comprising an edge region of the n(p)-emitter, a further n(p)-conductive semiconductor region inserted into the p(n)-base which is connected to the gates of the MIS transistors, and a sub-region of the p(n)-base lying therebetween; and means for connecting the gates of the MIS transistors to the anode.

4,509,070
METAL-INSULATOR-SEMICONDUCTOR TRANSISTOR DEVICE

Yuji Furumura, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 18, 1980, Ser. No. 218,007
Claims priority, application Japan, Dec. 27, 1979, 54-169165
Int. Cl.³ H01L *27/07*
U.S. Cl. 357—41 **15 Claims**



1. A metal-insulator-semiconductor device comprising: a semiconductor substrate and a MIS transistor and a MIS input element separately formed in combiantion with the semiconductor substrate;

said MIS transistor comprising a source region and a drain region, both having a first conductivity type, a channel region between said source and drain regions and having a second conductivity type opposite said first conductivity type, a gate insulating layer on said channel region and a gate electrode on said gate insulating layer, said source region, drain region and channel region all being formed in said semiconductor substrate;

said MIS input element comprising an input region of said second conductivity type, an insulating layer formed on said input region and an electrode formed on said insulating layer of said MIS input element, the insulating layer and electrode of said MIS input element respectively consisting of the same materials as those of said gate insulating layer and gate electrode of said MIS transistor;

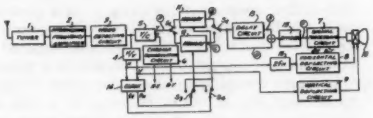
wherein said gate electrode of said MIS transistor and said electrode of said MIS input element are electrically interconnected; and

means connected to said input region for receiving an input signal to drive said MIS transistor.

4,509,071
DOUBLE-SCANNING NON-INTERLACE TELEVISION RECEIVER

Yasushi Fujimura, Musashino; Takashi Okada; Yutaka Tanaka, both of Yokohama, and Yasunari Ikeda, Funabashi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,206
Claims priority, application Japan, Nov. 5, 1981, 56-177459
Int. Cl.³ H04N *5/44*
U.S. Cl. 358—11 **21 Claims**



1. A double-scanning non-interlace television receiver for receiving an interlace television signal having alternating odd and even fields of scanned lines which are normally interlaced, as displayed, comprising:

receiver means for receiving said interlace television signal and generating received line signals representative of said scanned lines of a field being received;

visual display means; and

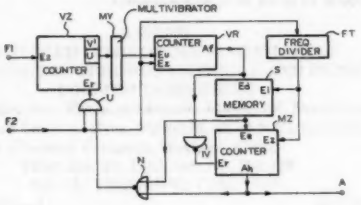
non-interlace converting means connected to said receiver means for generating an averaged line signal from two consecutive received line signals and for serially supplying said averaged line signal and said consecutive received line signals to said visual display means for display by the latter, with each said averaged line signal being supplied and displayed between the respective received line signals, said non-interlace converting means supplying said received line signals of each said odd field and said averaged line signals derived therefrom to said visual display means, and then supplying said received line signals of the following even field and said averaged line signals derived therefrom to said visual display means, whereby each of said scanned lines is scanned twice on said visual display means, said non-interlace converting means including memory means for storing said received line signals, delay means connected to said memory means for delaying said received line signals, and summing means connected to said delay means and said memory means for generating the sum of two of said received line signals.

4,509,072
DIGITAL CIRCUIT FOR PROVIDING A BINARY SIGNAL ON THE OCCURRENCE OF A PREDETERMINED FREQUENCY RATIO OF TWO SIGNALS

Herbert Elmis, Denzlingen, and Adrian Klar, Freiburg, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 350,556, Feb. 22, 1982, Pat. No. 4,454,531. This application Mar. 23, 1984, Ser. No. 592,900
Claims priority, application European Pat. Off., Mar. 9, 1981, 81 10 720.1

Int. Cl.³ H04N 9/44
U.S. Cl. 358—17 **17 Claims**



1. A digital circuit for determining when a predetermined frequency ratio occurs between a first signal at a first frequency and a second signal at a second frequency, said first frequency being higher than said second frequency, and for providing a digital output signal when said ratio occurs over a measuring period, said circuit comprising:

first means for counting the number of pulses of said first signal which occur during a predetermined period and for providing a first output signal when a predetermined count is reached, said predetermined count being offset from a first count corresponding to said predetermined ratio, said first output signal having a duration which has a predetermined relationship to the time required to count from said predetermined count to said first count;

second means for counting successive pulses of said second signal, said second means counting in a first direction when said pulses of said second signal occur in coincidence with said first output signal and counting in the reverse direction otherwise, and for providing a first signal state at an output when a second predetermined count is exceeded in said first direction; and

third means for counting successive third pulses to establish said measuring period and for providing said digital output signal when a predetermined number of successive ones of said third pulses occur when said output has said first signal state, said third pulses having a predetermined relationship to said second signal.

16. A digital circuit in accordance with claim **1**, for use in a television receiver wherein:

said first signal is a chrominance subcarrier frequency and said second signal is the horizontal frequency in a received color television signal and said third pulses are synchronous with the vertical deflection, and said third counting means thereby counts a predetermined number of field periods.

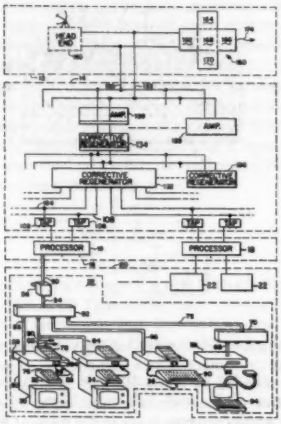
4,509,073
TWO-WAY CABLE-TELEVISION SYSTEM

Paul Baran, Menlo Park, and Maarten R. Pranger, Morgan Hill, both of Calif., assignors to Packet Technologies, Inc., Cupertino, Calif.

Filed Apr. 29, 1982, Ser. No. 373,048
Int. Cl.³ H04N 7/10
U.S. Cl. 358—86 **4 Claims**

1. A tree-type two-way data communications system for use in a cable televison system having a single head-end subsystem, a plurality of data sources and a cable television distribution network wherein each said data source is a source of digital commands to said head-end subsystem, said two-way system comprising:

a plurality of interface subsystems intermediate of said head-end subsystem and each one of said data sources, said interface subsystems being coupled in a tree structure to said head-end subsystem, each one of said data sources being coupled to one of said interface subsystems, and each one of said interface subsystems being coupled to at least one other of said interface subsystems, said interface subsystems receiving without acknowledgment through said cable distribution network from at least one of said



data sources said digital command signals, each said interface subsystem verifying data for mat and regenerating and forwarding at least some of said digital commands as command packet signals in a packet signal format on an uplinked carrier towards said head-end subsystem;

said head-end subsystems receiving said digital command signals as said command packet signals and developing response signals; and

said cable-distribution subsystem coupling response signals in a tree-structure without loops from said head-end subsystems to each one of said data sources through a common signal path independent of said uplink for acknowledging receipt of said command packet signals.

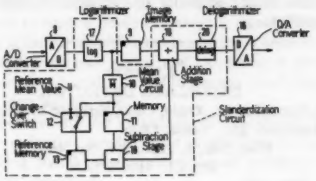
4,509,074
TELEVISION INSTALLATION COMPRISING A CIRCUIT ARRANGEMENT FOR THE COMPENSATION OF AMPLITUDE VARIATIONS

Peter Krauss, Bubenreuth; Jürgen Reinhardt, Aurachtal, and Johann Seissl, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 3, 1983, Ser. No. 463,485
Claims priority, application Fed. Rep. of Germany, May 17, 1982, 3218505
Int. Cl.³ H04N 7/18
U.S. Cl. 358—111 **6 Claims**

1. A television installation comprising: a television camera producing a video signal; a monitor; circuit means for amplification alteration of the video signal in dependence upon a standardization value; a presently occurring video signal being fed to an image memory and a standardization circuit; and said standardization circuit comprising a mean value circuit means for determining a mean value of a brightness of the presently

occurring video signal, a reference means for creating a reference brightness value, and logic element means for comparing



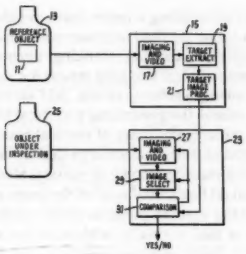
the mean value and reference value to create a standardization value for input to the circuit means for alteration.

4,509,075

AUTOMATIC OPTICAL INSPECTION APPARATUS

R. John Simms, Menlo Park, and Jerry D. Haney, Sunnyvale, both of Calif., assignors to Oxbridge, Inc., Mountain View, Calif.

Filed Jun. 15, 1981, Ser. No. 273,508
Int. Cl.³ H04N 7/18
U.S. Cl. 358—106 **35 Claims**



1. An automatic inspection apparatus for inspecting a series of illuminated objects comprising

means positionable on a properly configured object for identifying portions on the properly configured object;

means for recognizing the identifying means on the properly configured object including means for obtaining reference data from the identified portions and for deriving inspection instructions from the identifying means and from the reference data; and

data processing means responsive to the inspection instructions for evaluating data in accordance with the inspection instructions to derive an accept-or-reject decision, the data originating from subsequent objects, wherein the data processing means evaluate data corresponding to portions of the subsequent objects which portions are the counterparts of the identified portions of the properly configured object.

4,509,076

DEFECT INSPECTION APPARATUS

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 409,032, Aug. 17, 1982, abandoned, which is a continuation of Ser. No. 131,543, Mar. 18, 1980, abandoned. This application Jun. 5, 1984, Ser. No. 617,237
Claims priority, application Japan, Mar. 22, 1979, 54-33406
Int. Cl.³ H04N 7/18
U.S. Cl. 358—106 **2 Claims**

1. A defect inspection apparatus for inspecting small defects such as flaws comprising:

(a) image sensing means for picking up an object to be inspected and producing an analog video signal of said object;

(b) processor means for receiving said analog video signal and separating therefrom a horizontal synchronizing signal component and a video signal free of any unnecessary component;

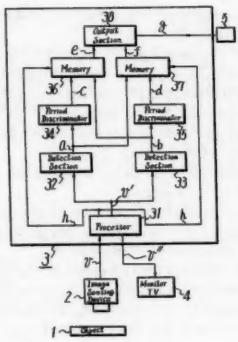
(c) a first section for receiving said video signal and converting said video signal to a digital signal having an output differentiation pulse at a rising edge thereof;

(d) a second detection section for receiving said video signal and converting said video signal to a digital signal having an output differentiation pulse at a falling edge thereof;

(e) a first period discriminator for receiving the output pulse from said first detection section and producing a signal with a period which is established in conjunction with the size of a defect to be detected;

(f) a second period discriminator for receiving the output pulse from said second detection section and producing a signal with a period the same as that of the signal from said first period discriminator;

(g) a first memory for receiving the signals from said first period discriminator section and the output pulse from second detection section and producing a signal when



both of said signals are present so as to detect a defect of a size smaller than that determined by the signal with the period derived from said first period discriminator, said horizontal synchronizing signal component being supplied to said first memory after receipt of the signals from said first period discriminator section and the output pulse from said second detection section so as to constantly clear said memory;

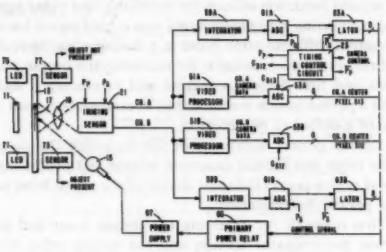
(h) a second memory for receiving the signals from said second period discriminator section and the output pulse from said first detection section and producing a signal when both of said signals are present so as to detect the defect of a size smaller than that determined by the signal with the period derived from said second period discriminator, and said horizontal synchronizing signal component being supplied to said second memory after receipt of the signals from said second period discriminator section and the output pulse from said first detection section so as to constantly clear said memory;

(i) output means responsive to said first and second memories for producing a defect detection signal when either one or both of said first and second memories produce output signals.

4,509,077
AUTOMATIC, SELF-DIAGNOSING, ELECTRO-OPTICAL IMAGING SYSTEM

Roger H. Therrien, Waterloo, Canada, assignor to NCR Canada Ltd-NCR Canada LTEE, Mississauga, Canada

Filed Dec. 17, 1982, Ser. No. 450,582
Int. Cl.³ H04N *5/30*
U.S. Cl. 358—139 **29 Claims**



1. An automatic, self-diagnosing, electro-optical imaging system comprising:

a reference background for reflecting radiant energy impinging thereon;

first means for illuminating said reference background with radiant energy during an on mode of operation;

second means including a photosensor for generating a first signal proportional to the intensity of reflected radiant energy received from said reference background during said on mode of operation;

third means responsive to the first signal for producing an associated first data signal;

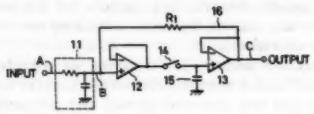
fourth means selectively responsive to the first signal and first data signal for selectively developing test signals during said on mode of operation; and

fifth means for initiating said on mode of operation, said fifth means including sixth means responsive to the first plurality of test signals for automatically testing the operation of each of said second and third means during said on mode of operation.

4,509,078
DROPOUT COMPENSATION CIRCUIT

Kazuo Kuroda, Saitama, Japan, assignor to Pioneer Video Corporation, Yamanashi, Japan

Filed Feb. 8, 1983, Ser. No. 465,066
Claims priority, application Japan, Feb. 8, 1982, 57-16087[U]
Int. Cl.³ H04N *5/14, 5/21*
U.S. Cl. 358—160 **5 Claims**



1. A dropout compensation circuit comprising:

a low-pass filter to which an information signal is inputted;

a first buffer amplifier;

a second buffer amplifier coupled to an output of said first buffer amplifier;

a switch interposed between said first and said second buffer amplifiers, said switch being opened when dropout occurs;

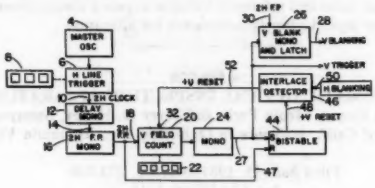
a holding capacitor for holding an input voltage of said low-pass filter when said switch is closed and for outputting the voltage held therein through said second buffer amplifier when said switch is opened; and

a feedback circuit for feeding back the output voltage of said second buffer amplifier to the input of said first buffer amplifier.

4,509,079
INTERLACE DETECTOR

John H. Harshbarger, Xenia, Ohio, assignor to Visual Information Institute, Inc., Xenia, Ohio

Filed Feb. 7, 1983, Ser. No. 464,687
Int. Cl.³ H04N *5/24*
U.S. Cl. 358—165 **14 Claims**

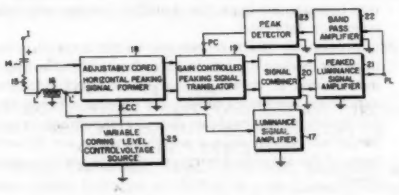


1. A system for controlling a raster beam capable of operating selectively in 1:1 or 2:1 field interlace comprising: horizontal blanking means for causing blanking during horizontal retrace of the beam, vertical blanking means for causing blanking of the beam during vertical retrace, said vertical blanking means including means for generating a vertical blanking control pulse which initiates the onset of vertical blanking, and an interlace correction circuit connected to said vertical blanking means for detecting the occurrence of vertical blanking during a normally unblanked horizontal scan of the beam and delaying the vertical blanking control pulse to delay vertical blanking until completion of said normally unblanked horizontal scan.

4,509,080
VIDEO SIGNAL PEAKING SYSTEM

William A. Lagoni, and Wayne E. Harlan, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,885
Int. Cl.³ H04N *5/14*
U.S. Cl. 358—166 **3 Claims**



1. In an image reproduction system, including a source of video signals representative of the luminance of an image to be reproduced, a video signal peaking system comprising:

means, responsive to said video signals for forming an adjustably cored horizontal peaking signal output, said forming means having a coring level control terminal, with the depth of coring of said horizontal peaking signal output effected by said forming means being dependent upon the level of a potential appearing at said control terminal;

means for developing a variable coring level control potential, said variable coring level control potential being supplied to said control terminal;

a gain controlled peaking signal translator responsive to said

adjustably cored horizontal peaking signal output of said forming means;

means for combining the output of said gain controlled peaking signal translator with video signals derived from said source to form a peaked luminance signal;

a frequency selective amplifier having an input responsive to said peaked luminance signal and exhibiting a passband encompassing a portion of the frequency band occupied by said video signals; and

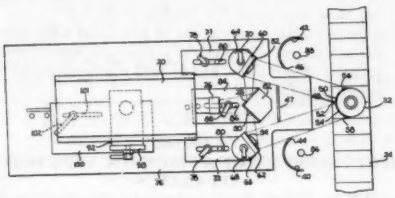
means, responsive to the amplitude of an output of said frequency selective amplifier for controlling the gain of said peaking signal translator in a sense opposing variations of said amplitude.

4,509,081

OPTICAL SYSTEM FOR AUTOMATIC SORTING AND INSPECTION EQUIPMENT

John J. Peyton, and Bryan K. Watt, both of Santa Barbara, Calif., assignors to Industrial Automation Corp., Goleta, Calif.

Filed Nov. 29, 1982, Ser. No. 445,282
Int. Cl.³ H04N 7/18
U.S. Cl. 358—225 **4 Claims**



1. A system for providing a video signal containing image portions of a container label representing an approximately 180 degree wrap of the label region thereof comprising

a conveyor means for providing a steady stream of containers substantially contacting each other along a conveyor path;

a video camera for receiving an image along the optical axis thereof approximately perpendicular to said conveyor path and providing a video signal in response thereto;

a first mirror for receiving light from a first area of a target container located substantially on the said optical axis of said video camera;

a second mirror for receiving light from a second area of the target container; and

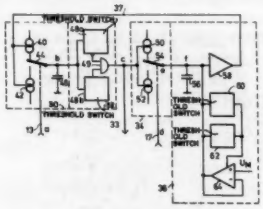
third and fourth mirrors adjacent said optical axis and positioned to reflect light from said target container and reflected by said first and second mirrors, respectively, along said optical axis, whereby said video camera may receive an image comprised of a first image portion of the first area of the target container and a second image portion of the second area of the target container, said first and second areas of the target container being substantially contiguous along one edge thereof and collectively representing an approximately 180 degree wrap of the container extending from adjacent the area of contact of the container into the next preceeding container on said conveyor means to adjacent the area of contact of the container with the next succeeding container on said conveyor means, said first and second image portions having sufficiently low image portions having sufficiently low image distortion over said first and second areas that said video camera will provide a video signal containing substantially all the detail of said first and second areas.

4,509,082

CIRCUIT ARRANGEMENT FOR GENERATING THE VERTICAL SYNCHRONIZING INFORMATION IN A MAGNETIC VIDEO TAPE APPARATUS

Klaus Kröner, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1982, Ser. No. 434,281
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142272
Int. Cl.³ H04N 5/93, 5/94, 5/782
U.S. Cl. 360—37.1 **9 Claims**



1. A circuit arrangement for generating the vertical synchronizing information in a magnetic videotape apparatus in which the magnetic tape is at least partly wrapped around a rotating head-support and the head support carries one or more magnetic heads which are uniformly space over the circumference of the head support, which magnetic heads consecutively write or scan adjacent tracks on the magnetic tape, which tracks are inclined relative to the longitudinal axis of the magnetic tape and each contain the information of one field and at a predetermined small distance from the edge of the magnetic tape contain the vertical synchronizing information, a track-change signal being generated, which signal is synchronized with the head-support rotation and indicates a track change, and which apparatus further comprises a video signal processing circuit for demodulating and amplifying the information from said magnetic heads, said video signal processing circuit including a line pulse generator for generating a line-pulse signal, which generator is synchronized by the horizontal synchronizing pulses in the video information, characterized in that said circuit arrangement comprises adjustable delay means for deriving a starting signal from the track-change signal, a vertical synchronizing generator coupled to said delay means for generating vertical synchronizing information for the video signal processing circuit from the line-pulse signal in substitution for that contained in said scanned tracks, and a phase comparator arranged to receive the starting signal and the line-pulse signal for controlling the delay time of the delay means such that the starting signal coincides with a phase range of a specific one of the line pulses, which phase range is situated between starting edges of two pulses in the line-pulse signal in which the vertical synchronizing information in said scanned tracks should occur.

4,509,083

HEAD TRACKING CONTROL FOR VIDEO TAPE RECORDER

Kenji Nakano, Ebina, Japan, assignor to Sony Corporation, Tokyo, Japan

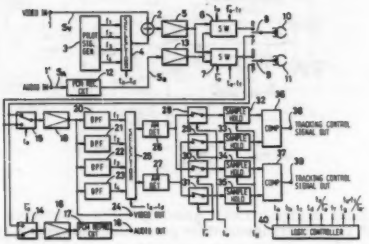
Filed Apr. 29, 1982, Ser. No. 373,128
Claims priority, application Japan, May 6, 1981, 56-67885
Int. Cl.³ G11B 5/58, 21/10
U.S. Cl. 360—77 **7 Claims**

1. Apparatus for reproducing an information signal comprised of a first video signal, a second information signal and tracking information signals recorded in parallel tracks on a record medium, said first video signal and said tracking information signals being recorded only in a first section of each of said tracks and said second information signal being recorded

with no tracking information signals in a second subsequent section of each of said tracks, said first video signal being recorded in said tracks in a first frequency range, said tracking information signals being recorded in said tracks in a second frequency range lower than and not overlapping said first frequency range, and said second information signal being modulated and recorded in said tracks in a third frequency range which overlaps at least said second frequency range of said tracking information signals, said apparatus comprising:

transducer means for scanning said tracks to reproduce sequentially said first video signal including said tracking information signals and said second information signals;

means for separating said tracking information signals from



said reproduced first video signal and producing error detection signals corresponding to scanning errors of said transducer means in response to said separated tracking information signals; and

means for holding an error detecting signal produced during scanning of the first section of each of said tracks and producing second-section tracking control signals, whereby the scanning of said second subsequent section of each of said tracks by said transducer means is controlled in response to said second-section tracking control signals derived from the tracking information signals included only with the first video signal and reproduced by said transducer means during scanning of the first section of the respective track.

4,509,084

ROTARY MAGNETIC HEAD

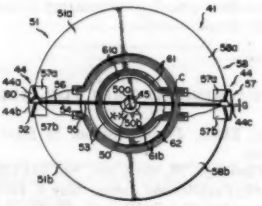
Yoshiharu Fujioka, Yamato; Akio Onuki, Ichikawa, and Tomio Sakamoto, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 29, 1982, Ser. No. 373,105

Claims priority, application Japan, May 11, 1981, 56-70490; Sep. 1, 1981, 56-137241

Int. Cl.³ G11B *5/08*

U.S. Cl. 360—84 **8 Claims**



1. In a rotary magnetic head having a pair of cylinders disposed coaxially, facing each other and forming a chamber therebetween, a rotating shaft extending substantially coaxial with said cylinders into said cylinders, a rotor mounted on said shaft in the chamber and including a pair of magnetic heads each having a gap of a predetermined length at one end, and a rotary transformer for coupling said magnetic heads to an external circuit, the improvement in which said rotor comprises:

a rotor core comprised of core halves having joining end faces which face each other, said core halves having a central portion and end portions, said end portions being used as the core halves of said magnetic heads and having a gap of a predetermined width, the central portions of said core halves having joining surfaces and being used as head base halves, said central portions forming a rotor-side core of said rotary transformer; and

centering means for centering the joining surfaces of said core halves, comprising an isosceles triangular notch cut in the joining surface of one of said head base halves, a bisector of the vertex angle of the isosciles traingular notch extending at right angles to the joining surface, and a semicircular notch cut in the joining surface of the other head base half, extending along the axis of said rotor, and having a radius larger than said rotating shaft, said centering means receiving the rotating shaft, holding the shaft in contact with the surface of the isosceles triangular notch and maintaining a clearance between the shaft and the semicircular notch so that an axis of the rotating shaft lies substantially at a midpoint between the outer tips of said head core halves and in a plane of the gaps between the end portions of said rotor core halves;

said rotor secured to said rotating shaft by means of a mounting plate secured to the rotating shaft; and

two semicircular grooves cut in said head base halves, to define a circuit whose center is identical with the center of rotation of said rotor, and to hold a rotor-side coil of said rotary transformer.

4,509,085

EJECTING DEVICE OF A MAGNETIC TAPE DRIVING APPARATUS

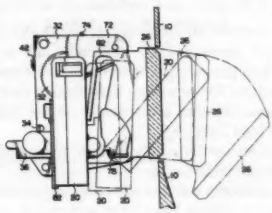
Shoichi Saito, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1982, Ser. No. 405,744

Claims priority, application Japan, Aug. 13, 1981, 56-127068; Aug. 13, 1981, 56-127069; Aug. 13, 1981, 56-120365[U]

Int. Cl.³ G11B *15/00, 19/18*

U.S. Cl. 360—93 **6 Claims**



1. An ejecting device for use in a magnetic tape driving apparatus of the kind having a rising surface relative to a horizontal plane, reel shafts having projected ends and whose axes intersect the riding surface, a magnetic tape driving mode setting switch movable between a first position where the reel shafts are stopped and a magnetic tape driving mode is cleared and a second position where the reel shafts are set for rotation and the magnetic tape driving mode is established, and an ejection switch movable between first and secodd positions,

wherein said ejecting device can move between a first position where reel hubs of a tape cassette held in the ejecting device in a holding space inside said tape driving apparatus are mounted on the projected ends of the reel shafts, and a second Position where the reel hubs are disengaged from the reel shafts and the tape cassette is outside the

holding space, and said device is arranged to move from its first position to the second position as the ejection switch held in the first position thereof is shifted to its second position, said ejecting device comprising:

a first base plate arranged to extend parallel to the axes of the reel shafts and to intersect the horizontal plane;

a second base plate attached to the first base plate so as to be rotatable substantially parallel to the first base plate between first and second positions, so that a lower portion of the second base plate below its axis of rotation relative to the first base plate is farther away from the projected ends of the reel shafts when the second base plate is located in its second position than when in the first position;

a third base plate rotatably attached to that portion of the second base plate below the axis of rotation of the second base plate relative to the first base plate, and arranged for rotation substantially parallel to the second base plate;

tape cassette retaining means on the third base plate for detachably holding the tape cassette;

said retaining means including a face plate for providing a covering surface for the holding space inside the tape driving apparatus when the second base plate is located in its first position, the vertical length of said face plate being less than the corresponding vertical length of the tape cassette to be held by a part of said retaining means;

a guide pin on the third base plate; and

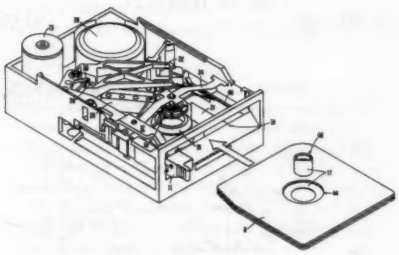
the first base plate having a guide hole in which the guide pin is fitted, so that the reel hubs of the tape cassette held by the tape cassette retaining means are mounted on the reel shafts when the second base plate is located in its first position, and that the reel hubs of the tape cassette held by the tape cassette retaining means are disengaged from the reel shafts to tilt the axes of the reel hubs relative to the axes of the reel shafts while the second base plate moves from its first position to the second position.

4,509,086

METHOD AND APPARATUS FOR LOADING AND REGISTERING A DISKETTE IN A DISKETTE DRIVE

Craig R. Hickethier; Ronald E. Hogan, both of Boulder, and Marvin E. Prahl, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 22, 1982, Ser. No. 391,050
Int. Cl.³ G11B *5/016*
U.S. Cl. 360—99 **14 Claims**



1. In a disk drive for reading and writing magnetic signals on a flexible magnetic disk housed inside a rigid cartridge having access openings for a spindle and a read/write head, said drive having a rotatable drive spindle for rotating the magnetic disk in a rotation plane inside the rigid cartridge, and said drive also having a read/write head for reading and writing signals on said magnetic disk as the disk rotates in the rotation plane, improved apparatus for loading said rigid cartridge in said drive, said improved apparatus comprising:

fixed guide means for guiding the cartridge as it is inserted into the drive and registering the cartridge on a guide surface in a registration plane parallel to the rotation plane;

said spindle and said head protruding into the insertion path of said cartridge and above said registration plane;

means for biasing the cartridge against the guide surface of said guide means and the top surface of said spindle as the cartridge is inserted;

said spindle having sides beveled to guide the leading edge of the cartridge up and over the spindle and head as the cartridge moves into the drive;

said biasing means pressing the cartridge against the top of the spindle and holding the cartridge away from said head as the cartridge passes over said spindle; and

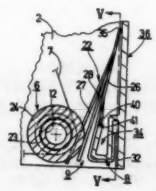
said cartridge biased onto the guide surface of said guide means by said biasing means when the spindle access opening aligns with said spindle whereby the cartridge is registered in the registration plane and said disk lies in the rotation plane.

4,509,087

TAPE GROUNDING ELEMENT IN A MAGNETIC-TAPE CASSETTE

Lothar Jäger; Anton Peter, and Reinhard Winkler, all of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 24, 1982, Ser. No. 423,000
Claims priority, application Austria, Jan. 7, 1982, 33/82
Int. Cl.³ G11B *15/60*
U.S. Cl. 360—130.21 **10 Claims**



1. A magnetic-tape cassette, adapted for use with a magnetic-tape apparatus having an electrically conductive locating pin which is arranged thereon and which is at the reference potential of the apparatus; said cassette comprising at least one electrically conductive cylindrical tape guide arranged to be movable to a limited extent and formed with at least one axial recess which is accessible from the exterior of the magnetic tape cassette for engagement by a locating pin of an apparatus in which the cassette is inserted, and a magnetic tape having a base side arranged to pass along a part of the circumferential surface of said tape guide, and a magnetic coating side,

characterized by comprising an electrically conductive resilient element associated with the tape guide, arranged inside the magnetic-tape cassette adjacent the coating side of the magnetic-tape, said element comprising at least two portions; one of said portions contacting the coating side of the magnetic tape at the location of the tape guide, and the other portion being an electrically conductive contact with the tape guide.

4,509,088

MOTOR PROTECTOR RELAY WITH MEMORY OF OVERLOAD

Mark V. Profio, Wauwatosa, Wis., assignor to Square D Company, Palatine, Ill.

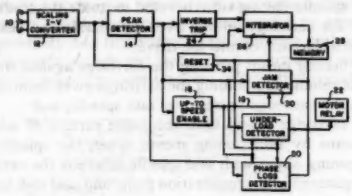
Filed Sep. 30, 1982, Ser. No. 430,074
Int. Cl.³ H02H *3/08*
U.S. Cl. 361—29 **4 Claims**

1. A method of protecting an electric motor from damage

caused by a prompt restart after an overload and a loss of power to a motor controller comprising the steps of:

producing a current signal that is a measure of current in the electric motor;

producing an integrated value of the current signal as a function of time;



leveling the integrated value when the motor is running within a maximum load limit;

storing the integrated value of the current signal in a memory for a predetermined time; and

preventing restart of the electric motor during the predetermined time.

4,509,089

TWO-POLE OVERCURRENT PROTECTION DEVICE

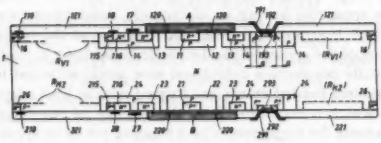
Per Svedberg, Vällingby, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed May 23, 1983, Ser. No. 497,326

Claims priority, application Sweden, Jun. 3, 1982, 8203432

Int. Cl.³ H02H *3/08;* **H03K** *17/72*

U.S. Cl. 361—100 **3 Claims**



1. In a two-pole overcurrent protection device for connection into a current-carrying conductor, the device comprising a normally conducting thyristor provided with turn-off means and having, in turn, a first emitter layer, a first base layer, a second base layer and a second emitter layer, and a MOS transistor integrated with the thyristor, connected in parallel with the PN-junction between said first emitter layer and said first base layer and arranged, when the voltage across the thyristor exceeds a predetermined value, to short-circuit the said PN-junction for turning off the thyristor, the improvement wherein the MOS transistor has control means connected via a Schottky diode to said second base layer of the thyristor, the Schottky diode comprising a junction between said second base layer and a contact layer arranged on said second base layer and connected to said control means of the MOS transistor, being arranged adjacent to, but separated from, a semiconductor layer which is of the same conduction type as said first base layer and which is connected to said first emitter layer, and having a reverse direction which coincides with the blocking direction of the thyristor.

4,509,090

COAXIAL LIGHTNING ARRESTING STRUCTURE

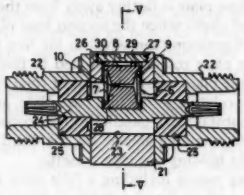
Norihide Kawanami; Yukinori Miyake; Kenji Kawamura, all of Tokyo, and Toshiharu Toda, Mitaka, all of Japan, assignors to Hirose Electric Co., Ltd., Tokyo and Mito Teck O., Ltd., Ibaragi, both of, Japan

Filed Jun. 20, 1983, Ser. No. 505,852

Claims priority, application Japan, Jun. 23, 1982, 57-107779

Int. Cl.³ H02H *9/06*

U.S. Cl. 361—119 **6 Claims**



1. A coaxial lightning arresting structure comprising an inner conductor, an outer conductor surrounding the inner conductor and an arrester tube located between the inner and outer conductors perpendicularly to the direction of transmission and connected at its ends to the inner and outer conductors, respectively, the portion of said inner conductor provided with the arrester tube having a reduced effective sectional area as compared with the other portions of the inner conductor so that the ratio of the outer conductor inner diameter to the outer diameter of said inner conductor portion having the reduced effective sectional are is greater than the ratio of the outer conductor inner diameter to the inner conductor outer diameter at the other portions thereof, which latter said ratio provides the coaxial transmission line with a given characteristic impedance.

4,509,091

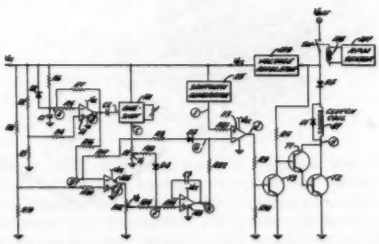
METHODS AND APPARATUS FOR CONTROLLING THE ENGAGEMENT OF GAP-TYPE ELECTROMAGNETIC COUPLINGS

Dwight E. Booth, Janesville, Wis., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Feb. 17, 1984, Ser. No. 581,108

Int. Cl.³ H01F *7/18*

U.S. Cl. 361—154 **23 Claims**



1. Apparatus for energizing the multiple-turn winding of an electromagnetic coupling having an armature and a rotor separated by an air gap, said apparatus comprising:

first means for initially energizing said winding for a period of time sufficient to build magnetic flux between said armature and rotor and across said air gap so as to cause said armature and rotor to close the air gap between them;

second means for reducing the energization of said winding after the termination by said first means of said initial

energization so as to allow slippage between said armature and rotor; and

third means, operative after the reducing effected by said second means, for gradually increasing the energization of said winding so as to increase the coupling torque and decrease the slippage between said armature and said rotor.

4,509,092

LOCK AND RELATED KEY OF ELECTRONIC TYPE

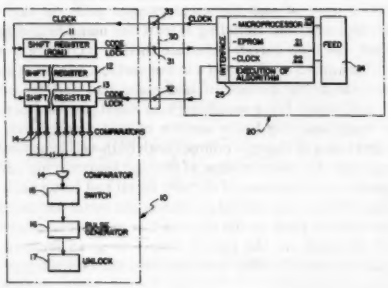
Antonino Invernizzi, Milan, Italy, assignor to Alfredo Scagliotti, Cogne, Italy, a part interest

Filed Oct. 6, 1982, Ser. No. 433,101

Claims priority, application Italy, Oct. 13, 1981, 24467 A/81

Int. Cl.³ H01H *47/22*

U.S. Cl. 361—172 **7 Claims**



1. A lock system comprising:

a lock comprising:

a movable locking element having an unlocking position and a locking position;

an actuator for moving said locking element between said positions;

a first memory storing a code;

a second memory which is not externally accessible and which contains a code indicating a result of an execution of a related algorithm on said code;

a third memory adapted to receive as information a code comparable with the code stored in the second memory;

means for comparing the codes stored in the second memory and the third memory and, if they match, for causing said actuator to move said locking element to said unlocking position; and

a key for said lock comprising:

a memory in which is stored at least one code identical to the code stored in the first memory, and the related algorithm;

an interface for interconnection with the lock; and

a microprocessor for receiving the code stored in the first memory through said interface, comparing the code stored in the first memory with the code stored in the memory of the key and, if they match, executing a processing of the code according to the related algorithm and transmitting the result of the execution to the third memory of the lock through said interface.

4,509,093

ELECTRONIC LOCKING DEVICE HAVING KEY AND LOCK PARTS INTERACTING VIA ELECTRICAL PULSES

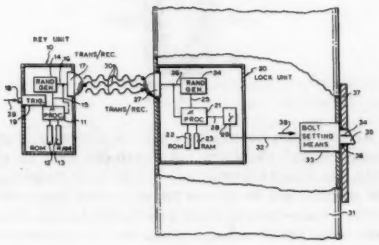
Karl-Heinz Stellberger, Velbert, Fed. Rep. of Germany, assignor to Hülsbeck & Fürst GmbH & Co. KG, Velbert, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,615

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1982, 3225754

Int. Cl.³ H01H *47/32*

U.S. Cl. 361—172 **10 Claims**



1. An electronic locking device of the type having pulse-operated interacting key and lock units each including a random number generator, data processing means connected to the random number generator and communication means connected to the random number generator and to the data processing means, the lock unit being connectable to an object to be locked and including a bolt control means which in response to an assigned key unit moves between an operative and an inoperative position, at least the lock unit generating, in response to a start pulse, a sequence of digital input data in the form of electrical pulses which are transmitted to the key unit, the key and lock units being preprogrammed respectively for a specific association between the unanimous input and output data generated at each unit, the two specific associations being in tune only for key and lock units which belong one to another, whereby the tuned up associations serve as an electric code for the units, a common comparator arranged at least in the lock unit for comparing the pulse sequences of the output data and for generating an actuation pulse for the bolt control means when the two pulse sequences are in tune, comprising

means for generating a start pulse at the key unit;

said input data being at least one randomized random number;

two-stage coding means for generating an electronic code characteristic of the associated pair of key and lock units, one coding stage including means for performing in each unit computations according to a preset algorithm whereby the resulting values of these computations depend on the input random number, the other stage of the coding means including means for generating from the results of the computations in the first-mentioned stage a fragmented number derived according to a preset formula or rule which is independent from the input random number; and

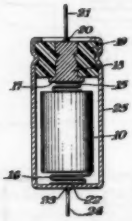
means for applying the fragmented numbers generated at respective key and lock units as said output data to said common comparator.

4,509,094

ELECTROLYTIC CAPACITOR FOR AT LEAST 150 V SERVICE

Manuel Finkelstein, North Adams, and Sidney D. Ross, Williamstown, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Feb. 21, 1984, Ser. No. 581,757
Int. Cl.³ H01G 4/22
U.S. Cl. 361—314 8 Claims



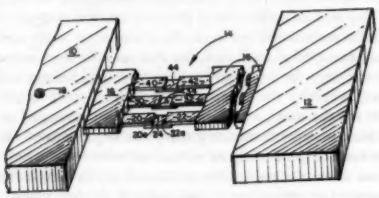
1. An aluminum electrolytic capacitor comprising two contiguously wound aluminum foil electrodes with interleaved spacers, one of said foils bearing a barrier layer dielectric oxide on its surface, and an electrolyte in contact therewith, said electrolyte comprising as solute a diisopropylamine or a triethylamine mono salt of azelaic acid dissolved in a solvent mixture of water and a solvent selected from the group of ethylene glycol, ethylene glycol and N-methylpyrrolidinone, ethylene glycol and N-methylpyrrolidinone and dimethylformamide, butyrolactone, and butyrolactone and N-methylpyrrolidinone and providing a capacitor that operates at 105° to 125° C. and at least 150 V.

4,509,095

FLEXIBLE CIRCUIT BOARD INTERCONNECT HAVING LOW THERMAL CONDUCTIVITY

John Boros, Irvine, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 8, 1982, Ser. No. 356,069
Int. Cl.³ H05K 7/20
U.S. Cl. 361—386 11 Claims



1. An apparatus in flexible electrical interconnection between first and second rigid circuit systems, said systems being desirably isolated thermally from each other against heat energy tending undesirably to transfer between said systems, comprising in combination:

a first flexible electrical conductor extending outwardly of a first rigid circuit system to terminate in a first end;

a second flexible electrical conductor extending outwardly of a second rigid circuit system to terminate in a second end; and

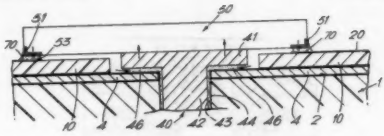
a third flexible electrical conductor bridging at least said first and second ends to provide said flexible electrical interconnection between said first and second systems and characterized by low thermal conductivity relative to at least one of said first and second conductors to thermally isolate said systems.

4,509,096

CHIP-CARRIER SUBSTRATES

Graham J. Baldwin, Cheltenham, and Michael O. McCann, Wotton-Under-Edge, both of England, assignors to Smiths Industries Public Limited Company, London, England

Filed Feb. 10, 1984, Ser. No. 578,924
Claims priority, application United Kingdom, Feb. 22, 1983, 8304890
Int. Cl.³ H05K 7/20
U.S. Cl. 361—386 11 Claims



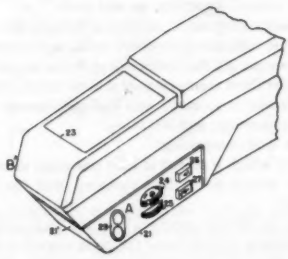
1. A chip-carrier substrate assembly comprising a chip-carrier substrate, a leadless chip carrier mounted on said substrate, said leadless chip carrier having a plurality of electrical contact pads spaced around its lower edge, said substrate including a substantially rigid multi-layer circuit board having electrical contact elements on its upper surface, solder joints electrically connecting said contact elements on said circuit board with respective ones of said electrical contact pads on said chip carrier, said substrate including at least one metal heat-dissipating layer, the chip-carrier substrate further including a metal pad with an upper surface and a lower surface, a layer of solder between the lower surface of said metal pad and the circuit board, said solder layer mounting said metal pad between said circuit board and the lower surface of said chip carrier, said metal pad being in thermal contact with both said heat-dissipating layer and the lower surface of the said leadless chip carrier, and the size and thickness of the said metal pad being such that the edges of said chip carrier overhang the metal pad and such that the contact pads on the chip carrier are spaced above the contact elements on the circuit board so as to increase the thickness of the said solder joint between the contact pads and the contact elements.

4,509,097

CONTROL UNIT INDIVIDUALLY SERVING TWO ADJACENT PASSENGERS

Ronnie D. Robinson, Mission Viejo, Calif., assignor to EECO Incorporated, Santa Ana, Calif.

Continuation-in-part of Ser. No. 273,712, Jun. 15, 1981, abandoned. This application Oct. 3, 1983, Ser. No. 538,463
Int. Cl.³ H05K 5/02
U.S. Cl. 361—395 12 Claims



1. One passenger control unit to individually serve two adjacently seated passengers that is affixable to a seat arm (2) disposed between the two passengers, comprising;

(a) only one housing (1), essentially symmetrical, side to side,

and having two independent sets of external manual controls (4–7),

(b) guide means upon said housing and said seat arm for removably stationarily affixing said housing to said seat arm,

(c) only one electrical connector means (**11**), attached to said guide means,

(d) one circuit board (**12**) within said housing, carrying essentially all electrical elements for said two independent sets of external manual controls,

(e) only one electrical connector (**14**) connected to said electrical elements and connectable to said electrical connector means (**11**), and

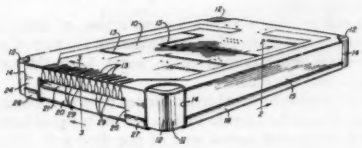
(f) only one cable (**10**) carrying conductors for at least one passenger service connected to said electrical connector means (**11**) to provide independent passenger controls for each passenger for each such passenger service, and having a connection to external means to supply each said passenger service.

4,509,098

ELECTRICAL PRINTED WIRING CIRCUIT BOARD CONSTRUCTION

Sujan DasGupta, and Merton B. Purvis, both of Worthington, Ohio, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 24, 1983, Ser. No. 469,164
Int. Cl.³ H05K *7/14*
U.S. Cl. 361—398 **11 Claims**



5. A printed wiring circuit board construction comprising a rectangular frame having opposite sidewalls having substantially parallel edges defining an open housing, a flexible tape having printed wiring affixed to one surface stretched over one side of said housing and folded about said sidewalls into the other side of said housing, and spring clamp means for clamping said tape to each of said sidewalls.

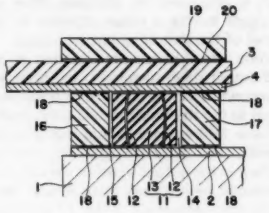
4,509,099

ELECTRONIC COMPONENT WITH PLURALITY OF TERMINALS THEREON

Toshiaki Takamatsu, Tenri; Fumiaki Funada, Yamatokoriyama; Shuhei Yasuda, Nara, and Masataka Matsuura, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 235,920, Feb. 19, 1981, abandoned. This application Feb. 18, 1983, Ser. No. 467,664
Claims priority, application Japan, Feb. 19, 1980, 55-20294
Int. Cl.³ H05K *1/14*
U.S. Cl. 361—413 **2 Claims**

1. An electronic component with a plurality of terminals thereon comprising in combination a rigid base plate having a plurality of terminal pieces juxtapositioned thereon next to each other and secured on one surface of said base plate, an interposing member provided with elastic flexible conductors having first and second end portions, each conductor extending in the thickness direction through said interposing member substantially perpendicular and corresponding to each of said terminal pieces, said interposing member adapted to retain said elastic conductors mutually insulated one from the other, said first end portions along the thickness direction of each of said elastic conductors being in individual contact with each of said terminal pieces on said base plate, a distributing sheet secured by way of said interposing member to an end portion of said base plate, the surface of said distributing sheet facing said interposing member being provided with a plurality of flexible terminals thereon in electrical contact with said second end portions of said elastic conductors, said flexible terminals being in electrical connection with said terminal pieces on said base plate along the thickness of said elastic conductors, a rigid



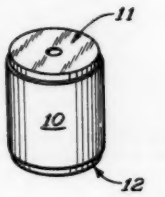
support plate having a flat face superimposed and bonded over its entire surface to an end portion of said distributing sheet corresponding to said end portion of said base plate, said flexible terminals being held rigid therebetween in contact with said elastic conductors by said rigid support plate, so as to maintain electrical contact at all times between said elastic conductors and said terminals.

4,509,100

LOW INDUCTANCE WOUND CAPACITOR

Henry F. Puppolo, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jan. 3, 1983, Ser. No. 455,348
Int. Cl.³ H01G *9/00, 1/14*
U.S. Cl. 361—433 **15 Claims**



1. An aluminum electrolytic capacitor comprising two electrode foils with interleaved spacer material convolutely wound into an extended-foil section, said section being impregnated with an electrolyte, the extended edges of said foils each being deformed in such a manner that said edges at the ends of said section are folded and subjected to a plastic deformation such that said edges are smeared and there is a metallurgical bond between adjacent of said foils to provide a low inductance capacitor section with low electrical series resistance absent any conductive coating of said edges.

4,509,101

PROTECTION CIRCUIT FOR SWITCHING POWER AMPLIFIER

Yokoyama Kenji, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

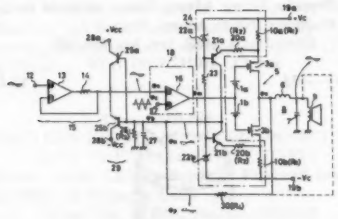
Filed Aug. 15, 1983, Ser. No. 522,989
Claims priority, application Japan, Sep. 28, 1982, 57-146759[U]
Int. Cl.³ H02H *7/20*
U.S. Cl. 361—79 **3 Claims**

3. A protection circuit for a switching power amplifier comprising:

first detection circuit means for detecting a current flowing through an output stage switching circuit means of said amplifier and outputting a first detection signal, wherein an output signal of the output stage switching circuit means is a pulse signal amplified by said switching circuit means and said first detection signal is an analogue signal corresponding to a pulse signal representative of the current which is integrated by low-pass filter means, said analogue signal having a phase opposite to that of said output signal of the switching circuit means;

second detection circuit means for detecting an output voltage of said output stage switching circuit means and outputting a second detection signal which has an amplitude proportional to the amplitude of said output voltage and a phase opposite to the phase of said first detection signal, wherein said second detection signal is an analogue signal corresponding to the output signal of the switching circuit means integrated by low-pass filter means, said analogue signal having the same phase as that of said output signal of the switching circuit means; and

amplitude limitation circuit means for limiting the amplitude of an input signal of said amplifier in response to said first and second detection signals, wherein said first detection signal operates to enhance an amplitude limitation function of said amplitude limitation circuit means, and said second detection signal operates to depress an amplitude limitation function of said amplitude limitation circuit means, whereby said first detection signal becomes dominant and a limitation level of said amplitude limitation circuit means decreases as a load resistance of said amplifier decreases, while said second detection signal becomes dominant and a limitation level of said amplitude limitation circuit means increases as the load resistance of said amplifier increases;



wherein said input signal of said amplifier is an analogue signal and has a same phase as that of said output signal of the switching circuit means, the amplifier including pulse-width modulation circuit means for pulse-width modulating said input signal of the amplifier based on a carrier signal having a constant frequency and outputting a pulse-width modulated signal having a pulse-width responsive to the amplitude of said input signal of the amplifier, said pulse-width modulated signal being applied to said output stage switching circuit means;

wherein said amplitude limitation circuit means adds said first and second detection signals, and limits the amplitude of said input signal of the pulse width modulation means in response to a resultant added signal obtained;

low-pass filter means for demodulating an output signal of said output stage switching circuit means which is an amplified pulse-width modulated signal, into an amplified analogue signal analogous to said input signal of the amplifier, said amplified analogue signal being applied to a load;

wherein said amplitude limitation circuit means comprises:

third and fourth transistor means each having emitter, collector, and base electrodes;

said emitter electrodes of said third and fourth transistor means being commonly connected to an input signal terminal of said pulse-width modulation circuit means,

said collector electrodes of said third and fourth transistor means being connected to positive and negative power supply means, respectively, and

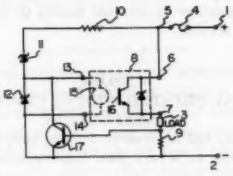
said base electrodes of said third and fourth transistor means being commonly connected together to receive said resultant added signal obtained by the addition of said first and second detection signals.

4,509,102

VOLTAGE CONTROLLED CURRENT SWITCH WITH SHORT CIRCUIT PROTECTION

John B. Ayer, Ontario, Canada, assignor to Canadian Patents & Dev. Limited, Ottawa, Canada

Filed Mar. 8, 1983, Ser. No. 473,256
Int. Cl.³ H02H 3/24
U.S. Cl. 361—92 **2 Claims**



1. A current source switch for undervoltage and overcurrent protection in combination a circuit having a current source and a load comprising:

opto-isolated switch means having a pair of input signal terminals and a pair of power terminals, the pair of power terminals being connected in series with the current source and the load;

a pair of avalanche breakdown diodes reverse connected in series across the current source, the input signal terminals being connected across one of the diodes to close the opto-isolated switch means when the current source voltage is above a predetermined value; and

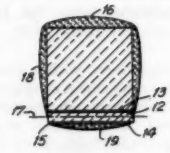
switch means for sensing the current in the series current source-load circuit, the sensing switch means being connected across the input signal terminals to open the opto-isolated switch means when the sensed current is above a predetermined value.

4,509,103

LOW DISSIPATION FACTOR MONOLITHIC CAPACITOR FOR HIGH FREQUENCY APPLICATIONS

John D. Prymak, Allegany, N.Y., assignor to AVX Corporation, Great Neck, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,926
Int. Cl.³ H01G 1/13
U.S. Cl. 361—321 **7 Claims**



1. A low loss, low value ceramic capacitor especially adapted for use in high frequency applications, comprising in combination a ceramic monolithic dielectric body portion in the form of a right geometric figure having a regular cross section portion taken in a direction normal to the longitudinal axis of said body portion, said body portion including a planar end surface, a first electrode formed on and covering essen-

tially the entirety of said end surface, an internal electrode disposed within said monolith said internal electrode being in proximate spaced parallel relation to said first electrode and being separated from said first electrode by a layer of said ceramic, the side margin edges of said internal electrode extended to and being exposed at the edges of said body portion, a first termination portion comprising a conductive mass covering the center of said first electrode and in electrical contact therewith and a second termination portion comprising a conductive cap member covering substantially the entirety of the sides of said body portion from the end of said body portion remote from said end surface to a level overlapping said exposed edges of said internal layer, said second termination portion being in electrical contact with said side marginal edges of said internal electrode throughout substantially the entire extent thereof.

4,509,104

HIGH TEMPERATURE RESISTANT LIGHTING DEVICE

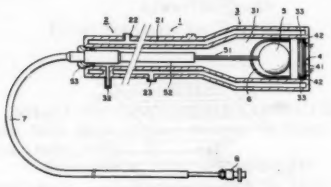
Koichi Suzuki, Suita; Seiroku Oose, Higashiosaka; Yuzo So, Ashiya, and Yasutaka Hirao, Munakata, all of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki, Japan

Filed Apr. 19, 1983, Ser. No. 486,343

Claims priority, application Japan, Apr. 27, 1982, 57-62997[U]; Dec. 28, 1982, 57-202129[U]; Dec. 28, 1982, 57-202130[U]

Int. Cl.³ F21V *7/04*

U.S. Cl. 362—32 **10 Claims**



1. A high temperature resistant lighting device for monitoring a high temperature environment, comprising: a metallic heat protective casing including a space section formed therein and a window made of a heat protective glass member disposed along a wall thereof, said casing further having a cooling path defined along a wall in said space section, except in said window, for circulation of a cooling medium; light source means housed in said space section of said metallic heat protective casing for lighting an object to be observed through said window in said high temperature environment, a bundle of optical fibers forming a light conductor cable leading into said heat protective casing, objective means secured in a position in said heat protective casing for picking up light reflected by said object through said window and for introducing the reflected, picked-up light into a tip portion of said light conductor cable, and means leading said light conductor cable outside said heat protective casing for observing said object inside said high temperature environment by an observer outside said high temperature environment.

4,509,105

LAMP ASSEMBLY

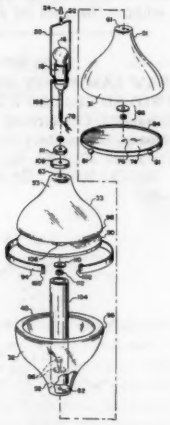
Henry A. Short, Sr., 556 E. 88th St., Chicago, Ill. 60619

Filed Mar. 5, 1984, Ser. No. 586,307

Int. Cl.³ F21P *1/02*

U.S. Cl. 362—122 **9 Claims**

1. A lamp assembly comprising a modular base portion, a lamp socket and shade supporting assembly mounted on said base portion and said base portion comprising first, second and third substantially identical-in-shape shells each having an annular flange at one end and an end wall at the other end, said shells being stacked with the annular flange of said first shell positioned on the bottom of said stack, two end walls of said first and second shells abutting each other, each end having an opening therethrough, means for securing said end walls together, two annular flanges of said second and third shells abutting each other and said end wall of said third shell mounting said lamp socket and shade supporting assembly, a platform positioned between said annular flanges of said second and



third shells and having a central opening therein, a hollow tube extending within said second and third shells between said end walls thereof, a lamp cord which extends through said end wall openings from said first shell to said lamp socket assembly, a display item on said platform, said third shell being transparent, and means for releasably clamping said second and third shells together.

4,509,106

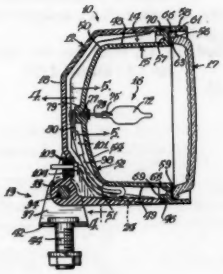
SELF-HOUSED RECTANGULAR LAMP ASSEMBLY WITH A REPLACEABLE HALOGEN BULB LAMP UNIT

William Mayer, and Alton E. Runions, both of Rochester, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Jun. 28, 1982, Ser. No. 392,338

Int. Cl.³ F21V *29/00*

U.S. Cl. 362—267 **7 Claims**



1. A self-housed rectangular lamp assembly having a replaceable lamp unit, comprising; a reusable cup-shaped housing member having a generally rectangular frontal configuration, a lamp unit adapted to be replaceably mounted in the housing member having a one-piece plastic reflector with a paraboloidal mirrorized inner surface, a halogen bulb unit mounted within the reflector, a lens enclosing the front of the reflector, axially interengaging alignment elements extending forwardly from a forward portion of the housing member and

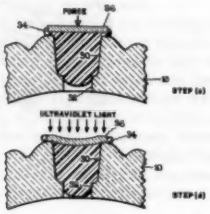
rearwardly from a forward portion of the reflector for holding the reflector in proper alignment in the housing member, a mounting projection formed integrally with and extending rearwardly from the reflector, and fastener means connected to the rear of the housing member and engageable with the reflector projection for drawing and holding the reflector and lamp unit in the housing member with the alignment elements interengaged without the need for any locking rings.

4,509,107

SEALED BEAM LAMP UNIT AND METHOD FOR AN IMPROVED SEALED EXHAUST HOLE

Richard F. Malinowski, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 27, 1983, Ser. No. 546,011
Int. Cl.³ H01K *3/26*; H01J *9/00*
U.S. Cl. 362—267 **10 Claims**



1. A method of sealing an exhaust hole of a sealed beam headlamp unit comprising the steps of:

(a) applying a predetermined amount of viscous ultraviolet light curable plastic in the form of a blob onto a piece of light-transmissive material,

(b) forcing both the curable plastic and the light-transmissive material into a region defining said exhaust hole, and

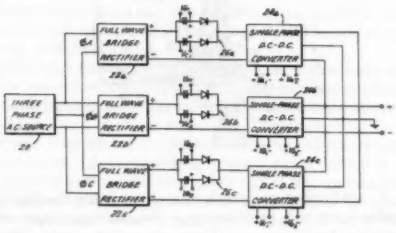
(c) applying ultraviolet light onto said piece of light-transmissive material effective to harden said plastic within said exhaust hole and effective to bond said piece of light-transmissive material to said curable plastic.

4,509,108

THREE PHASE A.C. TO D.C. VOLTAGE CONVERTER WITH IMPROVED POWER LINE HARMONIC CURRENT REDUCTION

George C. Gallios, Setauket, N.Y., assignor to Venus Scientific Inc., Farmingdale, N.Y.

Filed Sep. 15, 1983, Ser. No. 532,619
Int. Cl.³ H02M *1/12*
U.S. Cl. 363—45 **1 Claim**



1. A three phase a.c. to d.c. voltage converter comprising:

first, second and third rectifier circuits for rectifying respective phases of a three phase a.c. source into respective varying d.c. voltages;

first, second and third converters connected to the output of said first, second and third rectifier circuits, respectively, each of said converters converting the varying d.c. voltage generated by its respective rectifier circuit into a substantially constant d.c. voltage, each of said converters also generating at least one respective isolated d.c. voltage; and

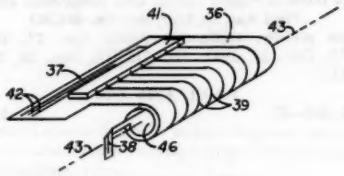
means for adding said at least one isolated d.c. voltage of each said converter to a respective one of said varying d.c. voltages such that all of said d.c. voltages are biased by at least one of said isolated d.c. voltages.

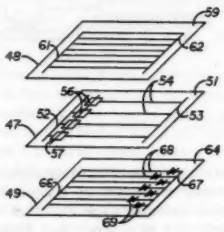
4,509,109

ELECTRONICALLY CONTROLLED COIL ASSEMBLY

Thomas C. Hansen, 1115 Sir Francis Drake Blvd., Apt. A, Kentfield, Calif. 94904

Filed Sep. 13, 1982, Ser. No. 417,222
Int. Cl.³ H02M *7/06*
U.S. Cl. 363—126 **17 Claims**





1. An electronically controlled coil assembly, comprising a substrate, a plurality of electrical conductors carried by the substrate and connected electrically in parallel to form the windings of a coil, and control means connected electrically in series with individual ones of the conductors for selectively controlling energization of said conductors.

4,509,110

METHOD AND APPARATUS FOR DETECTING FAILURES IN A CONTROL SYSTEM

Adelard Levesque, Jr., and John P. Rembold, both of North Palm Beach, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 7, 1982, Ser. No. 386,136
Int. Cl.³ G05B *17/00*
U.S. Cl. 364—153 **6 Claims**

1. A system for detecting the failure of apparatus, said apparatus including control means and an object of said control means, said system comprising:

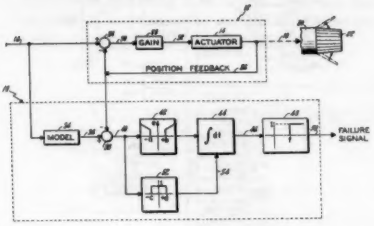
model means simulating the input/output characteristics of said apparatus;

means for providing the same input to said apparatus and to said model means;

means for continuously comparing the output of said object to the apparatus input and for operating on said object to eliminate any difference between the compared input and output;

means for continuously comparing the output of said object to the output of said model means and for calculating error signals corresponding to the differences therebetween;

means for integrating, over time, the absolute value of said error signals which are outside a predetermined deadband having limits −a and +b;



means for generating a failure signal when said integral exceeds a predetermined value; and

means for resetting said integral to zero whenever the value of the error signal is within predetermined limits −c and +d, where the absolute value of c is less than or equal to the absolute value of a, and the absolute value of d is less than or equal to the absolute value of b.

4,509,111

Patent Not Issued For This Number

4,509,112

SMALL PROGRAMMABLE COMPUTER

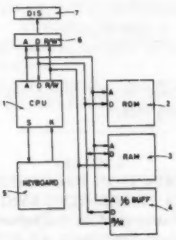
Mitsuhiro Saiji, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 28, 1981, Ser. No. 315,885

Claims priority, application Japan, Oct. 28, 1980, 55-152857

Int. Cl.³ G06F *7/04*

U.S. Cl. 364—200 **5 Claims**



1. A programmable computer comprising:

input means for inputting a plurality of program statements and a plurality of statement identifiers associated with respective statements;

memory means connected to said input means for storing said identifiers and associated statements;

comparing means responsive to said input means for comparing an identifier input by said input means with identifiers previously stored in said memory means for determining if an identifier input by said input means is identical to any previously stored identifier;

means responsive to said comparing means for storing in said memory means an input statement and an input associated identifier when said input identifier is not identical to any previously stored identifier; and

display means responsive to said comparing means for displaying a statement stored in said memory means associated with an identifier which is the same as an identifier input by said input means.

4,509,113

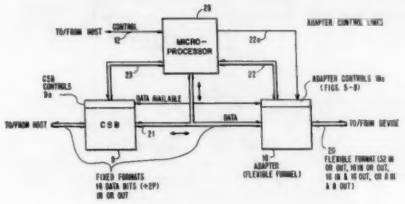
PERIPHERAL INTERFACE ADAPTER CIRCUIT FOR USE IN I/O CONTROLLER CARD HAVING MULTIPLE MODES OF OPERATION

Chester A. Heath, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1982, Ser. No. 345,177

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—200 **12 Claims**



1. In an I/O controller having interfaces for transferring data between a host processor system and one or more peripheral devices, an improved interface adapter comprising:

format conversion circuit means connectable in various configurations between said host processor and devices for transferring data between said processor and devices in various bit width-parallel formats;

multi-state control means dedicated exclusively for controlling said format conversion circuit means; and

means responsive to various transfer initiating signals produced under the direction of supervisory programs executed in said host system for variably conditioning said control means to sequence autonomously through various series of control states for causing said conversion circuit to transfer data between said host processor and said devices in various bit width-parallel formats pre-defined by said signals.

4,509,114

MICROWORD CONTROL MECHANISM UTILIZING A PROGRAMMABLE LOGIC ARRAY AND A SEQUENCE COUNTER

Joel C. Leininger, Boca Raton; Victor S. Moore, Pompano Beach, and William L. Stahl, Jr., Coral Springs, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,662

Int. Cl.³ G06F *9/22*

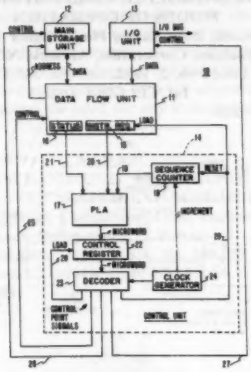
U.S. Cl. 364—200 **22 Claims**

1. In a microprogrammed data processor wherein a sequence of microwords are used to control the execution of each processor instruction, an improved microword control mechanism comprising:

circuitry responsive to the processor instruction to be executed for providing an instruction dependent signal uniquely representative of such instruction;

sequence counter circuitry for supplying a sequence of number signals;

and a programmable logic array responsive to the instruction dependent signal and to the sequence of number



signals for producing a sequence of microwords needed to execute the instruction.

4,509,115

TWO-PORT MEMORY CONTROLLER

John C. Manton, Marlboro, Mass.; Kenneth Okin, Saratoga, Calif., and Anthony N. Zacconi, Braintree, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 21, 1982, Ser. No. 370,520
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **10 Claims**

1. A memory unit for connection to a central processor unit over a first interconnection means which includes means for transferring address, transfer control and data signals, said memory unit being connectable to an input/output unit over a second interconnection means including means for transferring address, transfer control and data signals, said input/output unit including a storage location identified by an address, and said memory unit including a plurality of storage locations also identified by addresses and further comprising:

A. a first port means for connection to said first interconnection means for transmitting and receiving address, transfer control and data signals to and from said central processor unit over said first interconnection means;

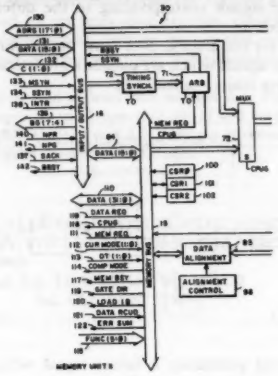
B. a second port means for connection to said second interconnection means for transmitting and receiving address, transfer control and data signals to and from said input-/output unit over said second interconnection means;

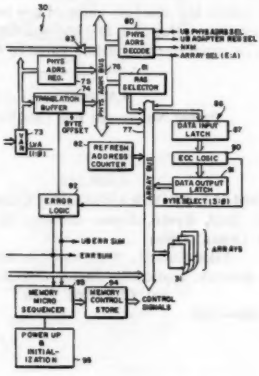
C. address multiplexer means connected to said first and second port means and responsive to control signals from said first and second port means for selectively transmitting address signals from one of said first port means or said second port means;

D. address decoding means connected to the output of said address multiplexer means for receiving the address signal transmitted by said address multiplexer means and for decoding the received address signal, said address decoding means transmitting a first control signal when the address signal identifies the storage location in the input-/output unit and a second control signal when the address signal identifies a storage location in said memory unit;

E. data signal transfer means connected to said first and second port means and said address decoding means for transferring data signals between said first and second port means in response to said first control signal from said address decoding means; and

F. address signal transfer means connected to said address multiplexer means, said second port means and said address decoding means for transmitting address signals from said address multiplexer means to said second port





means in response to said first control signal from said address decoding means.

4,509,116

SPECIAL INSTRUCTION PROCESSING UNIT FOR DATA PROCESSING SYSTEM

Stanley A. Lackey, Littleton; Kim A. Meinerth, North Andover, and David A. Stoner, Tewksbury, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

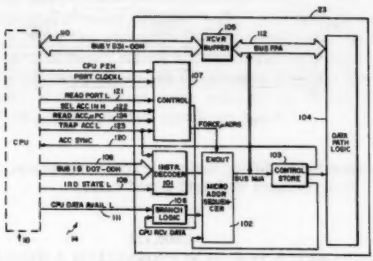
Filed Apr. 21, 1982, Ser. No. 370,390
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **7 Claims**

1. A special instruction processor for processing a predetermined class of instructions on a predetermined class of operands each containing a predetermined number of data words, the special instruction processor for connection to bus that also connects to a central processing unit that retrieves instructions and operands from, and transmits results of processing to, a memory, the instructions in said predetermined class each containing an operation code identifying the operation to be performed and the number of operands required to process the instruction, the bus including lines for transferring instruction operation codes, data words and control signals including timing signals defining successive bus cycles between the central processing unit and the special instruction processor, the special instruction processor comprising:

A. means arranged to be connected to the instruction opera-

tion code and control lines of the bus for receiving instructions of said predetermined class transmitted from the central processing unit and for decoding the instructions to determine the number of data words required to be received in order to process the operand;

B. means connected to said decoding means and arranged to be connected to the data and control lines of the bus for iteratively receiving data words over the data lines in successive bus cycles, the number of data words received being determined by said decoding means;



C. means connected to said decoding means and said receiving means and arranged to be connected to the control lines of the bus for processing the operands in accordance with the operation defined in the operation code and for transmitting a control signal to the central processing unit when the processing has been completed; and

D. means connected to said decoding means and arranged to be connected to the data and control lines of the bus for transmitting the results of processing to the central processing unit over the data lines in successive bus cycles in response to a control signal from the central processing unit.

4,509,117

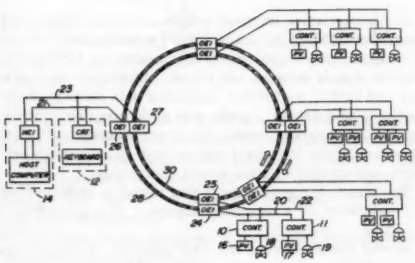
COMMUNICATIONS NETWORK ACCESS RIGHTS ARBITRATION

Simon Korowitz, Hatfield, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed May 3, 1982, Ser. No. 373,917

Int. Cl.[3] G06F *15/16*

U.S. Cl. 364—200 **7 Claims**



1. A method for transferring mastership in a multi-master communications channel of a distributed process control system having a plurality of microprocessor based control stations as devices intercommunicating in the control of a large number of variables of a complex industrial process, comprising the steps of:

grouping into a sequence forming a first logical loop the active stations which are high usage devices;

grouping into a sequence forming at least one other logical loop the active stations which are low usage devices;

passing mastership repetitively through the sequence of stations in the first loop at a maximum speed compatible with the work to be done by each station until a predetermined time period has elapsed since passing mastership through said other loop; and

upon expiration of said time period passing mastership once through the sequence of stations of the other loop and thence from the last station in that sequence to a predetermined station of the first loop for continuing repetitive passage through said first loop.

4,509,118

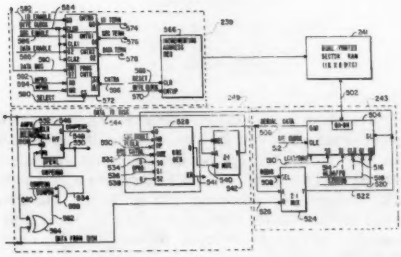
METHOD AND APPARATUS FOR DEFINING MAGNETIC DISK TRACK FIELD LENGTHS USING A PROGRAMMABLE COUNTER

William H. Shenk, Acton, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 25, 1982, Ser. No. 382,000

Int. Cl.[3] G06F *13/08*

U.S. Cl. 364—200 **11 Claims**



9. An apparatus for defining magnetic disk track field lengths comprising:

a. a programmable counter having a plurality of independent counters, each of said plurality of independent counters having an enable input, a clock input and an expiration output;

b. a plurality of enable counter means, each of said plurality of enable counter means connected to said enable input of a corresponding one of said plurality of said independent counters;

c. a unit data clocking means connected to the clock input of each of said plurality of independent counters;

d. an incrementing address register;

e. a memory for containing a plurality of units of data, an address input of said memory coupled to an address output of said incrementing address register;

f. a parallel to serial shift register having a parallel input/output coupled to a data input/output of said memory, a serial output of said shift register coupled to a serial input of said shift register and to an input for data to be written on a disk; and

g. a bit clocking means coupled to a clocking input of said shift register, whereby as each unit of data is transfered from said memory to said shift register each of said plurality of independent counters is clocked by said unit clocking means and those independent counters of said plurality of independent counters enabled by its corresponding enable counter means are incremented toward its corresponding predetermined count, when a first counter of said plurality of independent counters reaches its predetermined count its expiration output inhibits the further transfer of information from said memory to said shift register and causes a last unit of data transferred from said memory to be recirculated within said shift register and written to said disk until the expiration output of a second

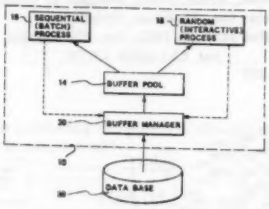
counter of said plurality of independent counters causes said incrementing address register to be reset to location zero causing a first unit of data from said memory to be transferred from said memory to said shift register.

4,509,119

METHOD FOR MANAGING A BUFFER POOL REFERENCED BY BATCH AND INTERACTIVE PROCESSES

Robert A. Gumaer, San Jose, and John A. Mortenson, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 24, 1982, Ser. No. 391,629
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **3 Claims**



1. A method for operating a computing apparatus including a main processor, a plurality of main storage buffers, and at least one external storage device; the main processor being operated under control of a data base system which includes a buffer manager for allocating data set pages read from the storage device into the buffers for concurrent access by both sequential and random processes; the method being characterized by the steps of:

(1) establishing a sequential steal threshold value of a queue as the product of the number of levels of out-of-line nesting most often expected per sequential processing instance times the maximum number of concurrent sequential processing instances most often expected;

(2) maintaining a normal least recently used (LRU) buffer chain and a sequential LRU buffer chain with sequential buffers included in both chains and the random buffer included only in the normal LRU buffer chain;

(3) placing buffers released from a sequential process that is not a prefetch process in both LRU buffer chains, and placing buffers released from a random process or from a sequential prefetch process only in the normal LRU buffer chain; and

(4) responsive to a sequential access request for a buffer, stealing the head buffer from the sequential LRU buffer chain provided the number of buffers in that chain exceeds the queue value, otherwise, stealing the head buffer from the normal LRU chain, because the number of buffers on the sequential LRU chain is not greater than the queue value or the request is for access by a random process, thereby preventing recursive steals of buffers employed in nested sequential processes.

4,509,120

VARIABLE CYCLE-TIME MICROCOMPUTER

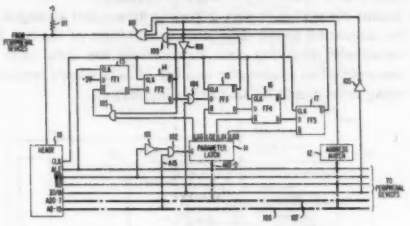
Douglas S. Daudelin, Jackson, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Sep. 30, 1982, Ser. No. 428,875
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—200 **14 Claims**

1. A microcomputer operable under program instruction control for communicating over peripheral access leads with a plurality of peripheral devices, said microcomputer including

means for controlling said communication during a single access instruction cycle of said microcomputer,

means for storing a value representative of a desired access instruction cycle time, and



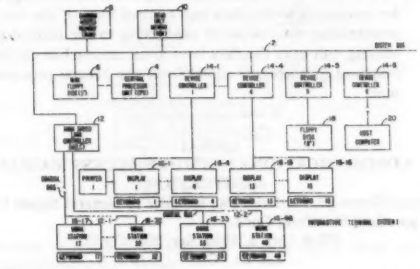
means for modifying said single access instruction cycle time in accordance with said stored value.

4,509,121

APPARATUS FOR SYNCHRONIZING A STREAM OF DATA BITS RECEIVED OVER A SINGLE COAXIAL CONDUCTOR

Thomas J. Rey, Bedford, and Ervin Forbes, Mansfield, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 30, 1982, Ser. No. 431,410
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **9 Claims**



1. An interactive terminal system includes a high speed link controller (HSLC) and a plurality of work stations, all coupled in common to a single conductor coaxial bus for transferring data bit signals between one of said plurality of work stations and said HSLC, said HSLC including data recovery logic for receiving said data bit signals, said data recovery logic including synchronization means for synchronizing said data bit signals received from said one of said plurality of work stations, said synchronization means comprising:

first means for generating a first plurality of binary signals indicative of a repeating sequence of consecutive numbers;

second means having the first plurality of binary signals applied to a first set of input terminals and a second plurality of binary signals applied to a second set of input terminals and generating a first signal where the numerical value of the first and the second plurality of binary signals are not equal, and generating a second signal when the first plurality of binary signals has a numerical value of less than the second plurality of binary signals;

third means having the first plurality of binary signals applied to a third set of input terminals and a third plurality of binary signals, one of which is the second signal applied

to a fourth set of input terminals and generating a fourth plurality of binary signals indicative of the sum of the first and the third plurality of binary numbers; and

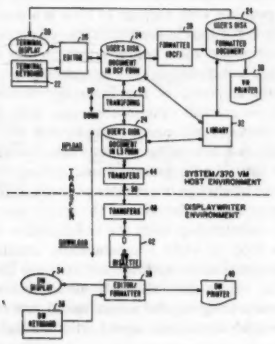
gating means responsive to the data bit signals representative of ZERO data bits and the first signal for generating a third signal, said first means being responsive to the third signal for generating the first plurality of binary signals equal in value to said fourth plurality of binary signals thereby increasing the numerical value of the first plurality of binary signals by the binary value of the second signal when the first plurality of binary signals is less than the second plurality of binary signals and decreasing the value of the first plurality of binary signals when the first plurality of binary signals is greater than the second plurality of binary signals for receiving said ZERO data bit signals at a numerical value wherein the first and the second plurality of data signals are equal.

4,509,122

METHOD FOR CONTROLLING THE FILE TRANSFER CAPABILITY OF AN INTERACTIVE TEXT PROCESSING SYSTEM THAT IS EMULATING A HOST PROCESSING SYSTEM TERMINAL

Palmer W. Agnew, Owego, N.Y.; John S. Coviello, San Jose, Calif.; Linda S. Green, Vestal, and Anne S. Kellerman, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1982, Ser. No. 442,817
Int. Cl.³ G06F *9/06*
U.S. Cl. 364—200 **3 Claims**



1. In cooperation with a hardware link and programming therefor that allows an interactive text processing system emulate a host data processing system terminal, a method for transferring information between a user's host disk and the private storage media diskette of said text processor, said method comprising the steps of:

(a) placing a master program to control information transfer in the host environment;

(b) placing an elementary diskette control program, responsive to said master control program, in the text processing environment; and

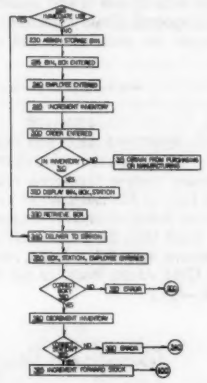
(c) prefacing all blocks of information intended to flow between said user's disk and said diskette with a unique identifier that is recognized by said terminal emulation programming as not belonging to said emulation function so that it may be steered to said master program or said diskette control program, as required.

4,509,123

AUTOMATED TRACKING PROCESS FOR MANUFACTURING AND INVENTORY

William J. Vereen, Dogwood Cir., Moultrie, Ga. 31768

Filed Jan. 6, 1983, Ser. No. 429,178
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—300 **13 Claims**



1. A process for storage and retrieval of items in inventory with the aid of a programable digital computer and a plurality of reading means adapted to read labels and communicate said label to said computer, comprising the steps of:

(a) establishing within said computer a plurality of data records, each said data record being identifiable with and adapted to record the characteristics, location and contents of labeled elements;

(b) selecting a plurality of items of like characteristics, each said item bearing a machine-readable identification code label unique to the item bearing said label, and identifying one said data record corresponding to the item bearing sad label;

(c) selecting a common container, said container bearing a machine-readable identification code label unique to said container, and identifying one said data record corresponding to the container bearing said label;

(d) reading said labels of said plurality of items of like characteristics and of said container by use of one said reading means, and updating said data records of said container and said items to indicate the location of said items inside said container;

(e) selecting an inventory storage space in which to store said container from among a plurality of inventory storage spaces, each said space bearing a machine-readable identification code label unique to the space and having a data record corresponding to said space, reading said labels of said selected space and said container by use of one of said reading means, and updating said data records of said container and said space to indicate the location of said container inside said space;

(f) receiving an order for items, identifying one said data record corresponding to said order, recording said order in said data record corresponding to said order, comparing said order with said data records for said items stored in said spaces, and identifying selected items in said inventory storage spaces having characteristics corresponding to characteristics demanded by said order;

(g) identifying of each said space and each said container in which each said selected item is located;

(h) retrieving each said identified container to a predetermined picking area, each said picking area having one said reading means associated therewith and a data record within said computer corresponding thereto;

(i) entering said label of each said selected container by use

of said reading means associated with said predetermined picking area, and updating said data records of each said inventory storage spaces, said selected container and said picking area to indicate the location of each said selected container in said picking area; and

(j) retrieving said selected items from each said selected container, reading said labels of said order and each said selected items by use of said reading means, and updating said data records of said order and each said selected items to indicate the retrieval of said selected items for said order.

4,509,124

LOCK-UP CONTROL SYSTEM FOR LOCK-UP TYPE AUTOMATIC TRANSMISSION

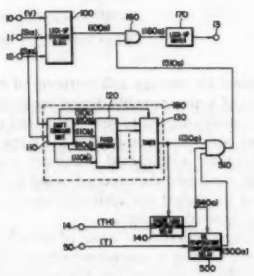
Tadashi Suzuki; Yoshiro Morimoto; Hideo Hamada; Masaaki Suga, and Takashi Murasugi, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 29, 1982, Ser. No. 362,852

Claims priority, application Japan, Mar. 30, 1981, 56-46975

Int. Cl.³ G06F *15/20;* **B60K** *41/02, 41/22;* **F16D** *27/16*

U.S. Cl. 364—424.1 **5 Claims**



2. A lock-up control system for a vehicle equipped with a lock-up type automatic transmission, said transmission being responsive to a shift command to shift from one gear to another and including a torque converter which assumes one of a lock-up state and a torque converter state in response to a lock-up command signal, the lock-up control system comprising:

means for sensing values of predetermined operating parameters of said vehicle and for generating a lock-up enable signal when said values indicate said vehicle to be operating within a predetermined lock-up range;

means for detecting the presence of said shift command and for generating a timer trigger signal in response to a positive detection of the presence of said shift command;

means for sensing the temperature of transmission fluid within said transmission and for generating a temperature signal indicative of said sensed transmission fluid temperature;

means responsive to said temperature signal and said timer trigger signal for determining a time duration required for said transmission to shift gears in response to said shift command and for generating a lock-up inhibit signal indicative of said time duration, said time duration being determined at least in accordance with said temperature signal; and

means responsive to said lock-up enable signal and said lock-up inhibit signal for generating a lock-up command signal in response to the presence of said lock-up enable signal and the absence of said lock-up inhibit signal; and for not generating said lock-up command signal in the presence of said lock-up inhibit signal.

4,509,125

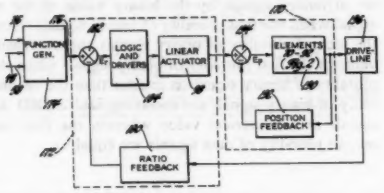
CONTINUOUSLY VARIABLE TRANSMISSION RATIO CONTROL SYSTEM

Gerald T. Fattic, Anderson, Ind., and William J. Vukovich, Pittsfield Township, Washtenaw County, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 6, 1982, Ser. No. 405,909

Int. Cl.³ G06F *15/20;* **B60K** *41/12, 41/18*

U.S. Cl. 364—424.1 **4 Claims**



1. For a continuously variable speed ratio transmission control system having an inner servo loop for adjusting the transmission speed ratio in accordance with the position of an actuator member, the response of the inner loop being characterized in that the rate of change in speed ratio with respect to actuator position is a nonconstant function of the actual speed ratio, apparatus defining an outer servo loop for adjusting the position of the actuator member in a manner to establish a desired speed ratio in said transmission, comprising:

control means for determining the ratio error according to the difference between the actual speed ratio and the desired speed ratio, and for adjusting the actuator member in a direction to reduce such ratio error, such control means being effective when the ratio error is at or above a predetermined value for regulating the rate of adjustment of said actuator member so that the rate of change in actuator position with respect to time is a direct function of the ratio error to relatively quickly reduce such error to the predetermined value below which further such adjustment would compromise system stability in view of the nonconstant response of the inner servo loop, thereby providing an overall system response with satisfactory shift feel, such control means being further effective when the ratio error is below the predetermined value for regulating the rate of adjustment of said actuator member so that the rate of change in actuator position with respect to time is a nonconstant function of the actual speed ratio and in inverse relationship with the nonconstant function of said inner loop to yield a substantially constant rate of change of speed ratio with respect to time for all actual speed ratio values for relatively slowly reducing such error, thereby bringing the actual speed ratio into correspondence with the desired speed ratio in a stable manner.

4,509,126

ADAPTIVE CONTROL FOR MACHINE TOOLS

Eugene A. Olig, and Lee R. Ladwig, both of Fond du Lac, Wis., assignors to AMCA International Corporation, Fond du Lac, Wis.

Filed Jun. 9, 1982, Ser. No. 386,481

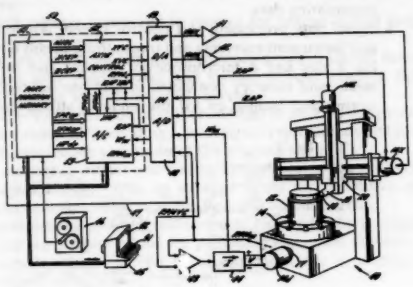
Int. Cl.³ G06F *15/46;* **G05B** *13/02*

U.S. Cl. 364—474 **45 Claims**

1. In a machine tool wherein a cutter is driven relatively to the surface of a workpiece to remove a layer of workpiece material, the method of compensating the measured power supplied to the drive means for net power required for net acceleration of the drive means to signal a power value closer to the actual power dissipated at the cutter tip than the measured power supplied to the drive means, said method comprising the steps of:

(a) determining the value of the net power supplied to the

drive means that is required for net acceleration of the drive means, and



(b) subtracting the value of the net power determined in step (a) from the measured power supplied to the drive means.

4,509,127

CONTROL DEVICE FOR LOADING AND UNLOADING MECHANISM

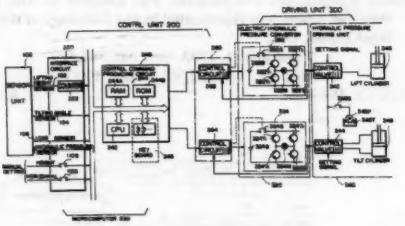
Katsumi Yuki, Toyota; Susumu Yoshida, Aichi; Mineo Ozeki, Ichinomiya; Yasuyuki Miyazaki, Aichi, and Masaru Kawamata, Numazu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoh Shokki Seisakusho, Japan

Filed Mar. 31, 1982, Ser. No. 364,403

Claims priority, application Japan, Mar. 31, 1981, 56-47736; Mar. 31, 1981, 56-47738; Mar. 31, 1981, 56-47742; Mar. 31, 1981, 56-45959[U]

Int. Cl.[3] **G06F** *15/20;* **G06G** *7/48*

U.S. Cl. 364—478 **19 Claims**



1. A control device for a loading and unloading mechanism adapted to a fork lift truck comprising:

(a) a sensor unit including a lifting height sensor for measuring lifting height of a fork and producing output signals indicative thereof,

(b) a control unit including

(i) an interface circuit having a lifting height counter for counting the output signals from the sensor unit,

(ii) a memory for storing data indicative of lifting height, said memory storing a data pattern shown target lifting height speeds with respect to an absolute value of a difference between a target lifting height and the present lifting height,

(iii) data input means for inputting control data indicative of lifting height into the memory, and

(iv) a control command producing circuit for performing a comparison calculation between the output signals of the sensor unit and the data stored in the memory, and for producing a valve opening command based on the comparison, said control command producing circuit operable for producing a control command for a target lifting speed in accordance with the difference read from said data pattern and in accordance with a current lifting height speed,

(c) a servomotor driving circuit for producing a control signal responsive to the valve opening command signal from the control unit,

(d) hydraulic pressure driving circuit producing a further control signal for hydraulically controlling a lift cylinder to vary the lifting height of the fork in accordance with the control signal fed from the servomotor driving circuit, and

(e) inhibiting means in said control device for inhibiting storage in said memory of lifting height control data when the sensed lifting height is above a preselected upper limit or below a preselected lower limit, thereby to prevent erroneous operations and to smoothly effect an automatic lifting height control.

4,509,128

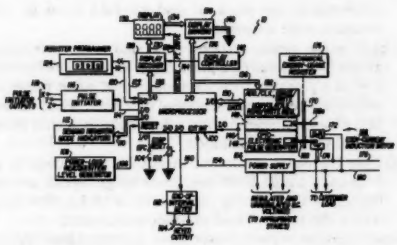
SOLID-STATE ELECTRICAL-POWER DEMAND REGISTER AND METHOD

Richard G. Coppola, Marietta, and George H. Stephens, Tucker, both of Ga., assignors to Sangamo Weston, Inc., Norcross, Ga.

Filed Apr. 16, 1982, Ser. No. 369,058

Int. Cl.[3] **G06F** *11/10, 15/46*

U.S. Cl. 364—483 **69 Claims**



1. A register for monitoring electrical-power demand made upon alternating current mains, comprising:

(a) means, responsive to power consumed from said mains, for computing values of electrical-power demand over a succession of demand-monitoring intervals, said computing means including:

(i) sensing means for providing pulses at a rate substantially proportional to consumption of electrical energy in said mains, said pulse rate being electrically programmable;

(ii) means for defining said succession of demand-monitoring intervals;

(iii) means, responsive to said sensing means and said defining means, for accumulating said pulses generated during each said demand-monitoring interval; and

(iv) means, responsive to said accumulating means, for generating said demand-monitoring interval values of electrical-power demand;

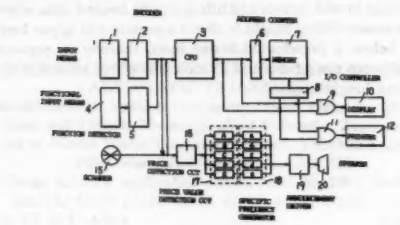
(b) means, responsive to said computing means, for determining a maximum demand-monitoring interval value of the electrical-power demand; and

(c) nonvolatile read/write memory means, responsive to said determining means, for storing said maximum demand-monitoring interval value even when said memory means is deenergized.

4,509,129
ELECTRONIC CALCULATING MACHINE WITH FACILITIES OF ANNOUNCING DATA INTRODUCED

Kenrow Yatsunami, Yamatokoriyama, and Yoshihiki Iwamoto, Sakurai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 85,302, Oct. 16, 1979,. This application Jun. 26, 1984, Ser. No. 625,003
Claims priority, application Japan, Oct. 16, 1978, 53-128803
Int. Cl.³ G10L *1/00;* **G06F** *15/02*
U.S. Cl. 364—513.5 **3 Claims**



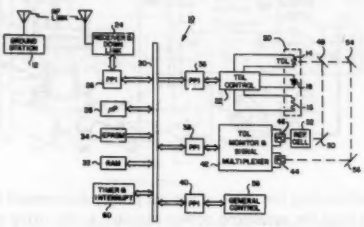
1. An electronic cash register comprising:
input means for entering product code information related to a product to be sold, said input means including a bar code reader for reading bar code information in connection with the specific article, a plurality of input keys for entering a specific price of the article, and function key for entering the type of article involved in a transaction;
price determination means responsive to said input means for determining the price of said product from its related produce code information;
classification means responsive to said price determination means for generating a price range signal representative of one of a plurality of price ranges, said price range signal generated being representative of a code which in simplified manner represents the price range in which the price of said product is included;
audible frequency generator means for producing an audio frequency signal from said price range signal, said audio frequency signal being representative of the price range in which the price of said product is included;
sound generator means responsive to said audible frequency generator means for generating an audible indication of the price range in which the price of said product is included, an operator thereby determining if a price determined by said price determination means is erroneous in magnitude; and
operator actuatable means operatively connected to said price determination means for correcting said determined price when said price range is determined by the operator to be erroneous from said audible indication.

4,509,130
DIGITAL CONTROL OF DIODE LASER FOR ATMOSPHERIC SPECTROSCOPY

Robert T. Menzies, Pasadena, and Charles W. Rutledge, Temple City, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 3, 1982, Ser. No. 384,547
Int. Cl.³ G01N *21/25, 21/29*
U.S. Cl. 364—556 **9 Claims**

1. In a system for remote absorption spectroscopy for measurement of trace species using an infrared diode laser having emission tuned over a predetermined spectral region by control of current through said diode laser and control of the temperature of said diode laser, the combination comprising
means for transmitting commands to and receiving data from an instrument in a remote location,
means for transmitting commands of both current and temperature set points in digital form to said instrument,
means in said instrument for receiving said commands and transmitting data,
a digital data processing and control system connected to said instrument receiving and transmitting means comprising a bus and a microprocessor, tuning and interrupt means and memory connected to said bus for receiving, storing and calling up for use under a stored program

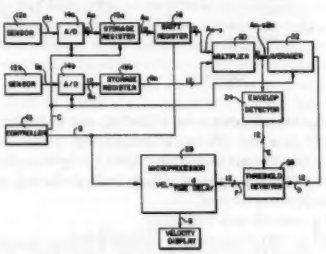


commands and data, including set points for current and temperature control of said diode laser,
current control means coupled to said bus by a peripheral interface means and responsive to said current set points called up by said microprocessor for establishing a stable current through said diode laser, and
temperature control means coupled to said bus by a peripheral interface means and responsive to said temperature set point called up by said microprocessor for establishing a stable temperature of said diode.

4,509,131
GEOMAGNETIC VELOCIMETER

David Krasnjanski, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1982, Ser. No. 383,429
Int. Cl.³ G01P *3/42;* **G06F** *15/336*
U.S. Cl. 364—565 **4 Claims**



4. A system for determining the ground speed of a vehicle comprising:
a first magnetometer mounted in a forward section of the vehicle, said first magnetometer having sufficient sensitivity to detect a geomagnetic field and being capable of generating a first signal representative thereof;
a second magnetometer mounted in a rearward section of the vehicle a predetermined distance from said first magnetometer, said second magnetometer having sufficient sensitivity to detect a geomagnetic field and being capable of generating a second signal representative thereof;
first and second digital converters connected to receive the first and second analog signals respectively for providing first and second digital signals respectively;

first and second storage registers respectively connected to receive the outputs of said first and second digital converters;

a shift register connected to receive the output of said first storage register;

a multiplier circuit connected to receive output signals from said shift register and said second storage register for providing a product signal thereof;

an envelope detector circuit connected to receive the product signal for providing a level signal representative of the instantaneous amplitude of the product signal;

an averaging circuit also connected to receive the product signal for providing an average signal representative of the cross-correlation of the first and second signals;

a peak detecting circuit connected to receive the level signal and the average signal for providing maximum similarity signals whenever said level signal exceeds a predetermined value; and

computing means connected to receive the maximum similarity signals from said peak detecting circuit and programmed for computing the velocity of the vehicle based on the distance between the first and second magnetometers.

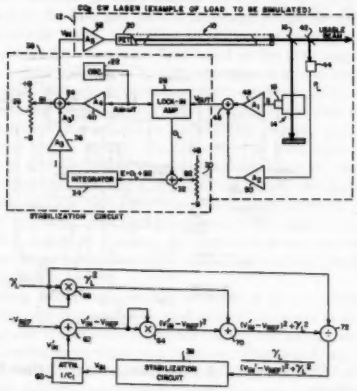
4,509,132
METHOD AND APPARATUS FOR TRANSFER FUNCTION SIMULATOR FOR TESTING COMPLEX SYSTEMS

Michael J. Kavaya, San Gabriel, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 11, 1982, Ser. No. 387,647

Int. Cl.³ G06G *7/48*; G06F *15/46*; H01S *3/13*

U.S. Cl. 364—571 **7 Claims**



1. A method for testing the operation of a stabilization circuit in a closed-loop system, where the stabilization circuit is designed to interact with an actual load in response to an output signal, V_{OUT}, by generating a control signal, V_{IN}, from said output signal in accordance with the transfer function of said actual load, comprising the steps of determining the transfer function of said actual load, programming computing means to implement said transfer function, utilizing said programmed computing means in place of said actual load in said closed loop, and testing the operation of said stabilization circuit in said closed loop, thus determining the operation of the stabilization circuit in a closed loop system free of any faults that may be present in said actual load to be stabilized.

3. Apparatus for testing the operation of a stabilization circuit having frequency stabilizing parameters in a closed-loop system for stabilizing a load, where said stabilization circuit interacts with an actual load in response to an actual load output signal, V_{OUT}, to provide a feedback signal, V_{IN}, comprising a load simulating signal generating means adapted to be substituted for said load and supplied with said feedback signal and at least one load parameter, and operative to transmit an output signal, V_{OUT}, as a function of said feedback signal and load parameter for simulating said actual load, and means for adjusting said load parameter.

4,509,133
APPARATUS FOR INTRODUCING CONTROL WORDS BY SPEECH

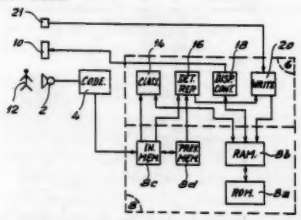
Jean-Jacques Monbaron, Malvilliers, and Ngoc C. Bui, Neuchatel, both of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed May 3, 1982, Ser. No. 374,019

Claims priority, application Switzerland, May 15, 1981, 3179/81

Int. Cl.³ G10L *1/00*

U.S. Cl. 364—513.5 **6 Claims**



1. A device for introducing control words by speech said words being pronounced by a speaker and belonging to a predetermined vocabulary of n words, said device comprising:

means for coding each word pronounced by the speaker in accordance with a first predetermined algorithm, which gives a coded word;

means for memorizing (a) n coded references each corresponding to the coding of one of the n words of said vocabulary in accordance with the said first algorithm and (b) at least one word pronounced by said speaker in coded form;

means for displaying one of said n words;

means for initiating a change in coded references to provide a different code corresponding to a word; and

a control circuit connected to the memorizing means and to the display means, comprising:

(a) repetition detection means for comparing a presently pronounced coded word to the previous coded pronounced word, if it exists, in dependence on a second predeter[illegible]ned algorithm, to detect whether or not the presently pronounced word is a repetition of the previously pronounced word;

(b) means responsive to the detection means for comparing a coded pronounced word when there is no repetition, to the n references, and to allocate to each reference a level of resemblance with the coded pronounced word in dependence on a third predetermined algorithm;

(c) means for causing the display of the memorized reference having a first level of resemblance when no repetition has been detected, and for causing, if repetition has been detected, the display of the word associated with the reference occupying the level of resemblance which immediately follows that of the reference associated with the word displayed immediately previously; and

(d) means for replacing in said memorizing means the reference associated with the word displayed last, said reference being replaced by the information corresponding to the coding of the word repeated, said replacement being

in response to activation by the speaker of the means for initiating a change of reference, when the speaker has found that the word displayed is the word that he actually pronounced, thereby providing a fresh coded reference for the word.

4,509,134

SQUARING DEVICE WITH COOLING MEANS

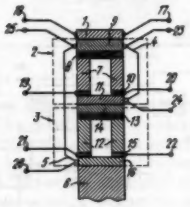
Jury S. Maltsev, ulitsa Kalinina, 8, kv. 52; Viktor D. Shevchenko, gorodok 17, dom 366, kv. 9, and Mikhail M. Chernin, ulitsa Lenina, 41, kv. 9, all of Omsk, U.S.S.R.

PCT No. PCT/SU80/00192, § 371 Date Jun. 18, 1982, § 102(e) Date Jun. 18, 1982, PCT Pub. No. WO82/01949, PCT Pub. Date Jun. 10, 1982

PCT Filed Nov. 28, 1980, Ser. No. 395,041

Int. Cl.³ B06G *7/20*

U.S. Cl. 364—813 **4 Claims**



1. A squaring device comprising an electrical heater with leads serving as inputs of said squaring device; a first cooling means having first and second working surfaces, said first working surface of said first cooling means being maintained in thermal contact with said heater, and said first cooling means having leads serving as a first output of said squaring device; a second cooling means having first and second working surfaces, said first working surface of said second cooling means being maintained in thermal contact with said second working surface of said first cooling means, and said second cooling means having leads serving as a second output of said squaring device; a first temperature sensor having its first and second sensitive elements maintained in thermal contact with said first and second working surfaces of said first cooling means, respectively; a second temperature sensor having its first and second sensitive elements maintained in thermal contact with said second working surface of said second cooling means and one of said working surfaces of said first cooling means, respectively; and, a heatsink maintained in thermal contact with said second working surface of said second cooling means.

4,509,135

COSINE SIGNAL CORRECTION CIRCUIT

Norman W. Parker, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 165,474, Jul. 2, 1980,. This application Sep. 30, 1982, Ser. No. 429,379

Int. Cl.³ H03K *3/023*

U.S. Cl. 364—826 **3 Claims**

1. A cosine signal corrector comprising:

first input means for receiving a first input signal which is approximately cos f(t) where f(t) is an information signal;

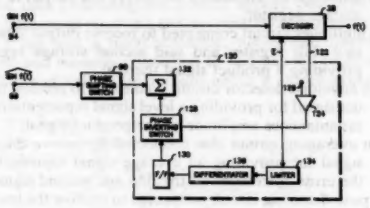
second input means for receiving a second input signal which is approximately equal to $\sin^2 f(t) + \cos^2 f(t)$;

third input means for providing a reference signal;

comparator means coupled to the second and third input means for providing an error signal in response to any error in the approximated second input signal;

adder means coupled to an output of the comparator means and to the first input means for adding the error signal to the approximate cos f(t) signal; and

circuit means coupled to an output of the adder means for deriving sgn cos f(t), and coupled to the output of the



comparator means for inverting the phase of the error signal in response to sgn cos f(t).

4,509,136

TELLER MACHINE WITH PRESET ABILITIES

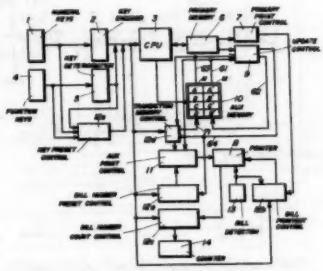
Koichi Horigome, Nara; Seizo Okada, Osaka; Katsuji Nishimura, Habikino, and Hachizou Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 31, 1979, Ser. No. 44,315

Claims priority, application Japan, Jun. 1, 1978, 53-66395; Jul. 25, 1978, 53-92138; Jul. 25, 1978, 53-92139; Jul. 25, 1978, 53-92140; Jul. 25, 1978, 53-92142

Int. Cl.³ G06F *15/00*

U.S. Cl. 364—900 **8 Claims**



1. A teller machine for performing various teller functions comprising:

a keyboard panel including numeral keys and function keys for introducing transaction data representative of the various teller functions;

primary memory means for storing the transaction data introduced by said keyboard panel;

auxiliary memory means for accumulating all transaction data associated with selected ones of said various teller functions and for storing the accumulated data;

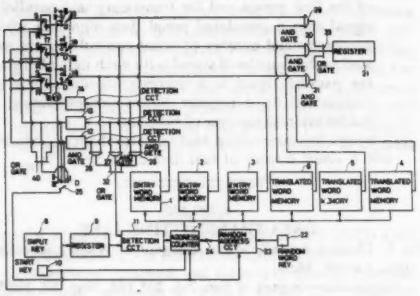
control means for receiving said transaction data from said primary memory means and for transferring the said transaction data associated with only the selected ones of said various teller functions to said auxiliary memory for accumulation therein, said control means including a preset memory means for storing an indication of whether each of said function keys corresponds to a selected teller function.

4,509,137

LANGUAGE TRANSLATOR WITH RANDOM GENERATION OF TEST WORDS DURING LEARNING MODE

Kunio Yoshida, Yamabe, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1980, Ser. No. 176,294
Claims priority, application Japan, Aug. 17, 1979, 54-105157
Int. Cl.[3] G06F *15/38, 7/58, 3/14*
U.S. Cl. 364—900 5 Claims



1. A combined language interpreter and language learning aid device for selectively either inputting a word in a first language to obtain an equivalent word in a second language or for testing an operator's knowledge of said first and second languages, said device comprising:

mode selector means for selectively setting said device in a language interpretation mode or a learning aid mode;

first and second memory means for storing a plurality of words in the first and second languages, respectively, said first words being equivalent to respective second words;

input means for entering a first word in the first language;

access means responsive to said input means in said language interpretation mode for sequentially retrieving first words in said first language and second words equivalent to said first words from said first and second memory means;

detection means operatively connected to said input means and to said first memory means for detecting equivalency between said entered first word and each retrieved first word, and for providing a signal to said access means in said language interpretation mode for advancing said access means to retrieve another first word and second word when a retrieved first word is not equivalent to said entered first word;

indicating means operatively connected to said detection means and responsive to said detection means in the language interpretation mode for displaying a retrieved second word equivalent to a retrieved first word when said retrieved first word is equivalent to said input first word;

random address generating means for providing random addresses in the learning aid mode;

wherein said access means is operatively connected to said random address generating means and is responsive thereto in said learning aid mode for progressively randomly retrieving first words in said first language and second words equivalent to said first words;

wherein said indicating means is responsive to said access means in said learning aid mode for displaying progressively retrieved second words;

wherein said detection means comprises means for providing a signal for said random address generating means and said access means in said learning aid mode for advancing said access means to retrieve another first word and second word when said input first word is equivalent to a retrieved first word;

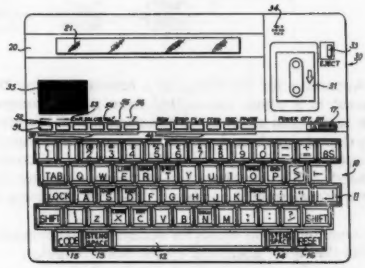
wherein said indicating means is responsive to said detecting means in said learning aid mode to repeatedly display a retrieved second word when said input first word is not equivalent to a retrieved first word.

4,509,138

WORD PROCESSOR

Yoshio Hayashi, Zushi; Kouji Aoyagi, Ayase; Toshio Sakurai, Yokohama; Tusnehiro Kashima, Tokyo, and Koichi Higeta, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 328,836
Claims priority, application Japan, Dec. 13, 1980, 55-176892
Int. Cl.[3] G06F *7/00*
U.S. Cl. 364—900 16 Claims



1. A word processor device on which a page of a textual document can be composed and edited, and in which textual data representing said page can be temporarily stored and the stored textual data transferred to and from magnetic tape wound on a tape cassette, the word processor device being a unitary and integral device and comprising:

keyboard means integrally formed with said word processor device for manually entering said textual data and for entering word processing commands;

information buffer means integrally formed with said word processor device and connected to said keyboard means for temporarily storing one page of said textual data;

character display means integrally formed with said word processor device for visually displaying at least a portion of the page of textual data stored in said information buffer means;

cassette recorder apparatus integrally formed with said word processor device for transferring said one page of said textual data between said information buffer means and the magnetic tape of said tape cassette, the latter containing any such pages of transferred textual data in sequential order; and

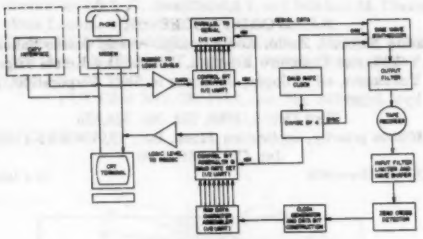
signal processing means for controlling the operation of said information buffer means and said cassette recorder apparatus for transferring said page of textual data to said magnetic tape in response to a word processing command entered on said keyboard means, and also transferring a stored page of said textual data from said magnetic tape to said information buffer means in response to another command entered on said keyboard means;

said keyboard means, said information buffer means, said cassette recorder apparatus, said signal processing means, and said character display means integrally forming said word processor device being arranged in a size, shape and weight that is personally portable.

4,509,139
BINARY DATA STORAGE AND RETRIEVAL SYSTEM FOR SERIAL INTERFACE COMMUNICATIONS AND ARCHIVAL ACCESS

Robert L. Creager, Sr., Westerville, Ohio, assignor to Creager & Company, Westerville, Ohio

Filed Jan. 21, 1982, Ser. No. 341,230
Int. Cl.[3] G06F *3/00, 5/04, 13/00*
U.S. Cl. 364—900 **15 Claims**



1. Apparatus for recording at a remote location the data contained in a signal transmitted from a host computer, in which said signal consists of a succession of discrete serial binary digital signals each of which comprise a character byte, each byte including a predetermined number of control bits associated with a data character, each data character having a uniform predetermined number of bits, said apparatus including:

(A) communication means for accepting at the remote location the signal generated by the host computer;

(B) means for processing said signal including

(i) first means for receiving a serial input corresponding to the succession of discrete character bytes of said signal and converting said serial input into a parallel data signal, said first means including register means interconnected with a buffer means for providing a pulse at the beginning of each character byte within said signal to set the buffer means to store a number of bits corresponding to the uniform number of bits associated with each data character; and transmitter means for providing a parallel data signal of data character bits stored in said buffer means, from said buffer means when a number of bits corresponding to the predetermined number of bits in a data character of the said byte are stored in said buffer means; and

(ii) second means for receiving the parallel data signal corresponding to a data character from said buffer means of the first means and translating said parallel data signal into a translated serial data signal which comprises the predetermined number of bits of each of the data characters associated with the serial succession of bytes in the signal accepted by the communication means; and

(C) means for storing said translated serial data signal generated by the second means.

8. Playback apparatus for displaying a stored data signal present in a means for storing, in which a storage media stores a succession of binary digital signals corresponding to data characters in which, each data character has a uniform predetermined number of serial bits and the bits forming the characters are stored in a sequential string fashion, including:

(A) means for generating a signal corresponding to the stored sequential string of data characters from the storage media;

(B) signal processing means for processing the signal derived from said storage media including

(i) first means for receiving a serial input signal of a sequential string of data characters and converting said serial input signal into a parallel data signal, said first means including register means interconnected with a buffer means for providing a pulse at the beginning of each character to set the buffer means to store a number of bits from said serial input signal corresponding to the uniform number of bits associated with each data character of the signal; and transmitter means for providing a parallel data signal corresponding to the character bits stored in said buffer means from said buffer means when a number of bits corresponding to the predetermined number of bits in a data character are stored; and

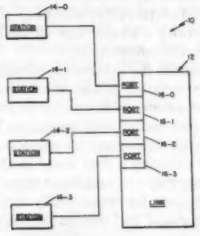
(ii) second means for receiving the parallel data signal corresponding to the character bits stored in the buffer of the first means and for translating said parallel data signal into a translated serial data signal in which a predetermined number of serial control bits are associated in the translated signal with each data character of the parallel signal in a correspondence with a pulse transmitted by a register means corresponding to a predetermined number of bits; and

(C) means for converting said translated serial data signal into a visual display of said data characters.

4,509,140
DATA TRANSMITTING LINK

Kin L. Cheung, Lowell, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Continuation-in-part of Ser. No. 205,164, Nov. 10, 1980, abandoned. This application Jun. 24, 1982, Ser. No. 391,778
Int. Cl.[3] G06F *3/04*
U.S. Cl. 364—900 **4 Claims**



1. A communications link for receiving data from one station of a data processing network having a plurality of asynchronous stations and forwarding such data to another station of the data processing network, said link including a plurality of data ports each constructed to receive data from and dispatch data to an associated station when connected thereto, a memory unit having operating cycles for storing data, computer elements other than said ports requiring memory access, memory priority circuitry, and interconnections connecting together said ports, memory unit, computer elements, and memory priority circuitry,

said memory unit including a common section accessable to all of said ports and a plurality of local sections each associated with one of said plurality of ports and accessable to its associated port and no other port,

each of said ports including decoding circuitry for receiving signals from its associated station and in response thereto emitting signals distinctively indicating the need for access to said common or local memory sections,

said computer elements requiring memory access including a processor for effecting manipulations of data in accordance with a program,

said interconnections including a dual memory bus system with a common memory bus subsystem providing direct access between said memory common section and any of said ports or said processor, and a local memory bus subsystem providing direct access between each of said ports and its corresponding local memory section and between said processor and any of said memory local

sections, said common and local subsystems being constructed and connected to enable concurrent independent use,

said memory priority circuitry including

means for supplying timed signals which for each memory unit operating cycle designate the one of said plurality of ports which may have access to said memory unit, the several ports being designated in cyclic order,

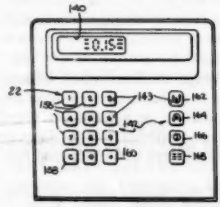
means for receiving said signals emitted by said ports distinctively indicating the need for access to said common or local memory sections and signals from said computer elements requiring memory access indicating need for access to said common or local memory sections and responsive thereto emitting signals enabling said currently designated port to use the common bus subsystem or the local bus subsystem in accordance with its signaled needs, and concurrently enabling said computing elements other than ports to use the memory bus systems not enabled to the currently designated port.

4,509,141

POSTAGE METER WITH KEYBOARD KEYS USED FOR CHANGING OPERATING CONSTANTS

John H. Soderberg, Stratford, and Edward C. Duwel, Trumbull, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,905
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **20 Claims**



1. In a postage meter having means for printing postage, means for displaying numerical values, means for entering data, computer means electrically connected to each of the aforesaid means and programmed for processing data for controlling the operation thereof, wherein said computer means is programmed for causing said postage meter to enter a service mode of operation in response to data entered from said data entering means, and wherein said computer means includes means for storing a first amount corresponding to a constant value for controlling operation of the postage meter, an improvement for changing the said first amount to a new first amount when said postage meter is in the service mode of operation, said improvement comprising:

(a) said data entering means including a keyboard, said keyboard including a plurality of depressable numeric keys and at least two depressable special purpose keys;

(b) said computer means including means programmed for causing said displaying means to display a first numerical value in response to the depression of selected numeric keys, said first numerical value corresponding to a second amount desired to be a replacement for said first amount;

(c) said computer means including means programmed for causing said display means to display a second numerical value in reponse to the depression of selected numeric keys, said second numerical value corresponding to a predetermined combination;

(d) said computer means including means programmed for entering said second amount in response to the depression of one of said special purpose keys and for entering said combination in response to the depression of another of said special purpose keys; and

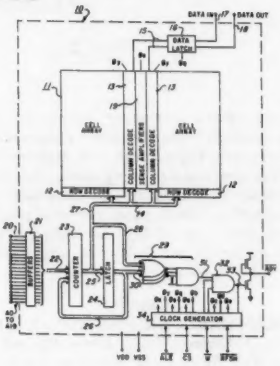
(e) said computer means including means programmed for automatically processing said second amount and said combination in response to entry of the later one of said second amount and said combination for replacing said first amount with said second amount, whereby said first amount is changed to said new first amount.

4,509,142

SEMICONDUCTOR MEMORY DEVICE WITH PIPELINE ACCESS

Jimmie D. Childers, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 15, 1982, Ser. No. 449,959
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—900 **15 Claims**



1. A memory drive comprising:

an array of memory cells;

accessing means for reading selected data from the array based upon a read address and for storing such data in a data latch;

a counter with means for incrementing the counter;

input address terminals for the device;

a comparator;

coupling means applying an input address from said terminals to said counter, to said accessing means and to one input of said comparator;

an address latch having an input connected to receive the incremented contents of the counter an output connected to an input of the comparator;

and means for activating either said accesssing means or said data latch in response to an output of the comparator.

4,509,143

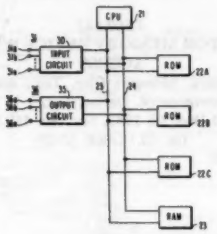
COMPUTER CONTROL SYSTEM FOR SELECTING A DESIRED CONTROL PROGRAM FROM A PLURALITY OF CONTROL PROGRAMS

Shinobu Tajima; Yasukazu Umeda, and Toshiyuki Kamohara, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 224,236, Jan. 12, 1981, Pat. No. 4,410,959. This application Aug. 1, 1983, Ser. No. 519,345
Int. Cl.³ G06F *9/22, 13/06;* B66B *1/18*
U.S. Cl. 364—900 **4 Claims**

1. In a control device for an elevator system comprising a central processing unit, a first read-only memory for storing a first set of program instructions for computing output control signals for operating controlling means of said elevator system in response to input instructing signals to said central process-

ing unit, an output circuit for communicating said output control signals to said controlling means, a first random access memory for storing said output control signals produced as a result of execution of said first set of program instructions immediately prior to said output control signals being communicated to said controlling means by said output circuit, and address and data buses for connecting said first read-only memory, said output circuit, and said first random access memory with said central processing means, the improvement comprising: a second read-only memory and a second random access memory, said second read-only memory and said second random access memory being connected to said central processing means by said address and data buses, said second read-only memory containing a second set of program instructions for selectively modifying said output control signals produced as a result of said first set of program instructions.



4,509,144

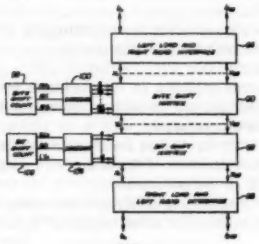
PROGRAMMABLE BIDIRECTIONAL SHIFTER

John Palmer, Hillsboro, Oreg.; Bruce Ravenel, Sunnyvale, Calif., and Rafi Nave, Kiriat Motzkia, Israel, assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 341,862, Jan. 22, 1982, abandoned, which is a division of Ser. No. 129,995, Feb. 13, 1980, Pat. No. 4,338,675. This application Dec. 5, 1983, Ser. No. 558,171

Int. Cl.[3] **G06F** *1/00;* **G11C** *19/00*

U.S. Cl. 364—900 **1 Claim**



1. A programmable bidirectional shifter for shifting a plurality of bits a plurality of bit positions during a single clock cycle comprising:

a selectively activated left load and right read interface circuit means for the loading of bits, which have been input and are to be shifted left and the reading of bits which have been shifted right which are to be output;

a byte shift matrix coupled to said left load and right read interface circuit means for performing a plurality of byte length shifts;

a bit shift matrix coupled to said byte shift matrix, for performing a plurality of bit length shifts;

a selectively activated right load and left read interface circuit means coupled to said bit shift matrix for the loading of bits which have been input and are to be shifted right and the reading of bits which have been shifted left and which are to be output;

a byte shift control circuit means coupled to said byte shift matrix to control the number of left and right byte shifts, said number of shifts being determined by the number of bit portions to be shifted and the number of bits per byte;

a bit shift control circuit means coupled to said bit shift matrix to control the number of left and right bit shifts, said number of shifts being determined by the number of bit positions to be shifted and the number of bits per byte;

whereby a left or right shift may be performed by said shifter for a plurality of bits a plurality of bit positions during a single clock cycle.

4,509,145

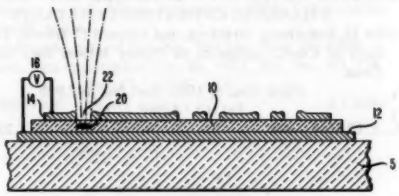
ELECTRICALLY BIASED OPTICAL STORAGE MEDIUM

Martin A. Bosch, Lincroft, and Ross A. Lemons, Tinton Falls, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 18, 1982, Ser. No. 389,877

Int. Cl.[3] **G11C** *11/42, 13/04*

U.S. Cl. 365—112 **17 Claims**



1. An optical storage medium which undergoes a perceivable optical change in a localized area upon illumination with electromagnetic radiation in a localized illuminated region, comprising a storage material which undergoes an optical change in said localized area upon localized heating characterized in that

(A) said localized illuminated region includes a portion of a photoconductive material which has an unilluminated resistivity of at least 10^6 Ohm-cm and which undergoes a resistivity decrease of at least 10^5 upon said illumination,

(B) said localized illuminated region is in thermal contact with said localized area of said storage material, and

(C) means are present for applying a voltage to said photoconductive material wherein said voltage application means are situated such that upon said illumination, a substantial current flows across said photoconductive material,

wherein said localized area of said storage medium is capable of undergoing an optical change of greater than 10 percent and wherein an information storage density greater than 10^7 bits/cm^2 is achievable.

4,509,146

HIGH DENSITY JOSEPHSON JUNCTION MEMORY CIRCUIT

Tsing-Chow Wang, Norristown, and Richard M. Josephs, Willow Grove, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 2, 1982, Ser. No. 446,129

Int. Cl.[3] **G11C** *11/44*

U.S. Cl. 365—162 **14 Claims**

1 A high density Josephson junction memory circuit comprising:

a substrate,

a ground plane pattern on said substrate,

a plurality of memory cells on said substrate,

each memory cell comprising a storage loop having a biasing

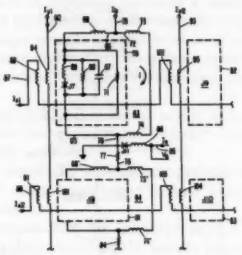
gate current source, a low reference voltage source and a storage loop connected between said current source and said voltage source,

said storage loop having a first branch and a second branch connected in parallel,

a single Josephson junction device in said first branch,

said Josephson junction device being mounted on the substrate adjacent and apart from said ground plane pattern,

an X current control line inductively coupled to said Josephson junction device,



a Y current control line inductively coupled to said Josephson junction device,

said coupling between said X and Y current control lines and said Josephson junction device being separated from said ground plane pattern so that the threshold characteristic of said Josephson junction device is symmetrical with respect to said biasing gate current, and

sensing means inductively coupled to said second branch of said storage loop for sensing the magnitude of the current flowing in said loop of said memory cell.

4,509,147

HIGH SPEED SEMICONDUCTOR MEMORY DEVICE HAVING A HIGH GAIN SENSE AMPLIFIER

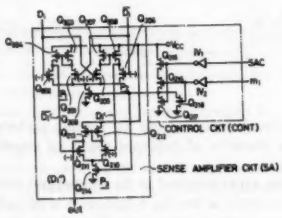
Nobuyoshi Tanimura; Sho Yamamoto; Kazuo Yoshizaki, and Isao Akima, all of Tokyo, Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 383,945

Claims priority, application Japan, Jun. 1, 1981, 56-82474

Int. Cl.³ G11C *11/34*

U.S. Cl. 365—190 **16 Claims**



1. A static type semiconductor random access memory comprising:

one or more memory cells each of which delivers a pair of signals complementary to each other;

a first dissymmetric type differential amplifier circuit having a non-inverting input terminal coupled to said memory cells to receive one signal of the pair of complementary signals, and an inverting input terminal coupled to said memory cells to receive the other signal of said pair of complementary signals, said first amplifier circuit including means for forming a first output signal in-phase with said signal received at its non-inverting input terminal;

a second dissymmetric type differential amplifier circuit having an inverting input terminal coupled to said memory cells to receive said one signal, and a non-inverting input terminal coupled to said memory cells to receive said other signal, said second amplifier circuit including means for forming a second output signal in-phase with said signal received at its non-inverting input terminal; and

first means coupled to said first and second amplifier circuits to receive said first output signal and said second output signal, said first means including means for forming a third output signal based on said first output signal and said second output signal,

wherein each of said first and second dissymmetric type differential amplifier circuits is a dissymmetric type differential amplifier which comprises a first insulated-gate field effect transistor of a first conductivity type having its gate coupled to said non-inverting input terminal, a second insulated-gate field effect transistor of said first conductivity type having its gate coupled to said inverting input terminal and having its source coupled to a source of said first insulated-gate field effect transistor, and first active load means connected between respective drains of said first and second insulated-gate field effect transistors and a first power supply, said first and second dissymmetric type differential amplifier circuits being coupled to at least one constant current source connected between sources of said first and second insulated-gate field effect transistors and a second power supply, and in which the signal in-phase with said signal received at its non-inverting input terminal is derived from said drain of said second insulated-gate field effect transistor.

4,509,148

SEMICONDUCTOR MEMORY DEVICE

Masamichi Asano, Tokyo, and Hiroshi Iwahashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

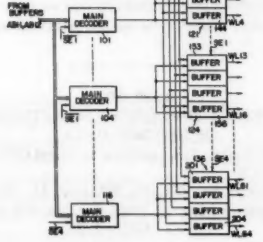
Continuation of Ser. No. 192,203, Sep. 30, 1980, Pat. No. 4,447,895. This application May 11, 1983, Ser. No. 493,605

Claims priority, application Japan, Oct. 4, 1979, 54-128392

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—230 **1 Claim**



1. An address designation circuit responsive to externally-generated address signals and comprising:

a plurality of first decoding circuits coupled to said address signals;

a plurality of second decoding circuits coupled to said address signals; and

a plurality of buffer circuits each including a plurality of buffers having first and second input terminals, said first input terminals of the buffers in each of said buffer circuits being commonly connected to an output of a different one of said plurality of said first decoding circuits, and said second input terminals of each buffer in each buffer circuit being connected to an output of a different one of said plurality of said second decoding circuits.

4,509,149

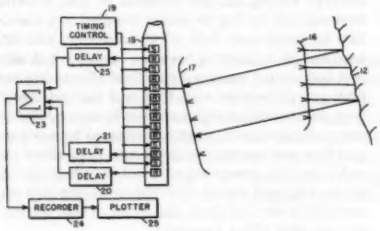
DIRECTIONAL LONG ARRAY FOR LOGGING VERTICAL BOUNDARIES

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 57,776, Jul. 16, 1979, abandoned. This application Oct. 8, 1981, Ser. No. 309,647

Int. Cl.³ G01V *1/40*

U.S. Cl. 367—27 **6 Claims**



1. A method of logging a variable shape vertical formation in the earth from a borehole comprising:

traversing said borehole with a linear array of interspersed and coextensive acoustic sources and acoustic receivers,

producing acoustic pulses from the acoustic sources of said array at spaced points along said borehole,

detecting the reflections of said acoustic pulses from the boundary of said vertical formation with the receivers of said array,

changing the directivity angle of the acoustic pulses of said array at each of said spaced points along said borehole through a range including that angle at which said acoustic pulses strike the formation orthogonally and are reflected orthogonally to said array of receivers with maximum energy,

recording the travel time only of the orthogonally reflected energy at each of the spaced points along said borehole, and

plotting a series of recorded travel times in a display of travel time from the borehole to said variable shape vertical formation boundary at spaced points along said borehole.

4,509,150

LINEAR PREDICTION CODING FOR COMPRESSING OF SEISMIC DATA

Aaron J. Davis, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 221,559, Dec. 31, 1980,. This application Mar. 23, 1983, Ser. No. 478,214

Int. Cl.³ G01N *1/28*

U.S. Cl. 367—76 **10 Claims**

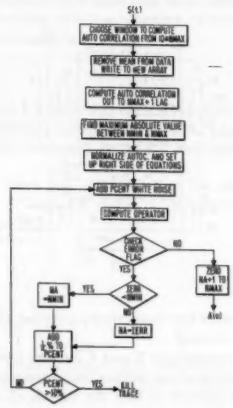
1. A method of seismic exploration, comprising the steps of transmitting acoustic energy through the subterranean structure of the earth to be reflected from an interface within the earth and return upwardly to the surface of the earth, detecting return of said energy, outputting electrical data signals in response thereto, and compressing said data signals for storage or transmission, said compression step comprising the following steps:

sampling said signals at a fixed rate to produce data samples;

generating a prediction operator;

analyzing pluralities of said samples successively in accordance with said prediction operator to yield a predicted value for the next data sample;

comparing said next data sample with the corresponding predicted value to yield a prediction error value;



quantizing said prediction error value to yield a quantum number; and

storing or transmitting said quantum number;

wherein said step of generating the prediction operator includes performing autocovariance on a plurality of samples, whereby low-frequency drift of said prediction errors is avoided.

4,509,151

MARINE ACOUSTIC ANALYSIS SYSTEM AND METHOD

George B. Anderson, Dallas, Tex., assignor to Sea World, Inc., San Diego, Calif.

Filed Jan. 22, 1982, Ser. No. 342,494

Int. Cl.³ G01S *3/80*

U.S. Cl. 367—118 **38 Claims**

1. An acoustic array system for sensing underwater marine sounds in a plurality of different bands of sound frequencies comprising:

an acoustic array adapted to be submerged including:

(a) a first portion having a first set of a plurality of hydrophones spaced longitudinally along its length, the length of the first portion being at least a substantial fraction of a first acoustic wavelength of a first band of sound frequencies, the spacing between the hydrophones in the first set being a minor fraction of the first acoustic wavelength; and

(b) a second portion comprising a second set of a plurality hydrophones spaced longitudinally along its length, the length of the second portion being a fraction of the length of the first portion and being at least a substantial fraction of a second acoustic wavelength of a second band of sound frequencies which is different than the

first band of sound frequencies, the spacing between the hydrophones in the second set being a minor fraction of the second acoustic wavelength; and

means connected to each of the first set and second set of hydrophones for presenting representations of output signals therefrom in separate frequency bands grouped around the first and second acoustic wavelengths for use in determining the identity of the source of the marine sounds received by the hydrophones and the direction of the source of marine sounds with respect to the acoustic array.

22. A method for identifying a marine animal by the underwater sounds which it produces by using a passive acoustic array coupled to a receiver for simultaneously but separately detecting underwater sounds present in at least one low frequency band and one higher frequency band which is distinct from the low frequency band, the method including the steps of:

detecting sounds propagated under water in both the low freguency band and in the high frequency band by plural kinds of marine animals;

analyzing and classifying the sounds present in each frequency band according to the animal known to have produced them; and

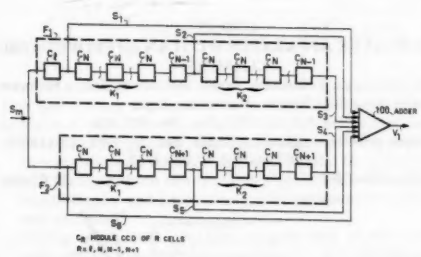
detecting the sounds from an unknown animal in both frequency bands and comparing the sounds present in at least one of the frequency bands with the previously classified sounds of known animals to identify the unknown animal.

4,509,152

CHANNEL FORMATION SYSTEM FOR PANORAMIC SONARS

André Buhart, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 6, 1982, Ser. No. 406,001
Claims priority, application France, Aug. 7, 1981, 81 15363
Int. Cl.³ G01S *7/52, 15/02*
U.S. Cl. 367—123 **3 Claims**



1. A device for the formation of channels for panoramic sonar systems comprising:

a circular base of N receiving transducers ($A_1 A_2 \ldots A_n$) for receiving N signals

a clock having a set frequency (Fe);

a multiplexing circuit coupled to said transducers for receiving said N signals which is controlled by said clock and for multiplexing said N signals;

shift registers coupled to said multiplexing circuit having lines for receiving said multiplexed signals;

taps provided on said lines of said lines of said shift registers for collecting the N delayed signals corresponding to the N receiving transducers, employed for the formation of a channel and for outputting a resultant signal;

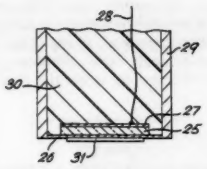
a summing circuit for supplying said channels sequentially wherein the delayed signals are obtained by means of two lines of shift registers, one line of said shift registers being composed of modules C_N having N cells and of modules C_{N-1} having N−1 cells and the other line of said shift registers being composed of modules C_N having N cells and of modules C_{N+1} having N+1 cells.

4,509,153

RESOLUTION TRANSDUCERS, SYSTEMS AND METHODS FOR THE TRANSMISSION AND/OR RECEPTION OF WAVES PROPAGATED BY VIBRATION

John P. Weight, Crowborough, England, assignor to National Research Development Corporation, London, England

Filed Feb. 17, 1982, Ser. No. 349,524
Claims priority, application United Kingdom, Feb. 19, 1981, 8105195
Int. Cl.³ B06B *1/02*
U.S. Cl. 367—140 **12 Claims**



4. A transducer for conversion between electrical signals and waves propagated by the vibration of the propagating medium, comprising:

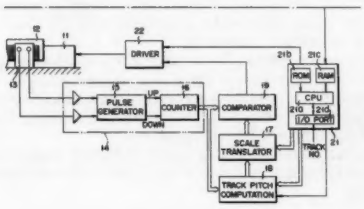
means for converting between edge waves and electrical signals, and for inhibiting conversion between plane waves and said signals, said means producing a constant peak pressure along the axis of transmission from the transducer into the far field if used for conversion from an electrical signal to said waves.

4,509,154

OPTICAL DISK APPARATUS

Katsumi Kimoto, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 14, 1983, Ser. No. 474,980
Claims priority, application Japan, Mar. 15, 1982, 57-40607
Int. Cl.³ G11B *17/06*
U.S. Cl. 369—33 **2 Claims**



1. A data recording apparatus comprising:

(a) a recording/reproducing head for recording data on a recording medium having a plurality of tracks and for reproducing the data from the recording medium;

(b) a position detecting means having a predetermined scale pitch for detecting the position of the head and for outputting a scale value representing the position of the head with respect to the plurality of tracks of the recording medium;

(c) a track pitch computing means for computing the pitch at which the tracks are arranged, by multiplying the scale value and the predetermined scale pitch and then by dividing the product of the multiplication by the number of said plurality of tracks;

(d) a scale value computing means for computing a new scale value by multiplying the number of said plurality of tracks by the track pitch computed by the track pitch computing means and then by dividing the product of the multiplication by the predetermined scale pitch;

(e) a head driving means for driving the recording/reproducing head until the scale value obtained by the position detecting means becomes equal to the scale value obtained by the scale value computing means; and

(f) a control means for controlling the position detecting means, track pitch computing means, scale value computing means and head driving means in such a manner that when the difference between the number of a track to which the head has been moved by the head driving means and the number of any desired track to which the head is to have an access surpasses a predetermined value, the track pitch computing means computes a track pitch from the track number to which the head has been moved and supplies the track pitch to the scale value computing means, so that the scale value computing means computes a scale value thereby to move the head to the desired track.

4,509,155

CIRCUIT ARRANGEMENT FOR A DISK PLAYER FOR REPRODUCING INFORMATION PRERECORDED IN THE FORM OF PITS

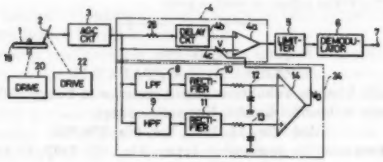
Isao Masuda, Sagamihara; Kazunori Nishikawa, Machida; Yoshiki Iwasaki, Yokohama, and Makoto Komura, Tokyo, all of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed May 28, 1982, Ser. No. 383,258

Claims priority, application Japan, Jun. 1, 1981, 56-84191

Int. Cl.³ G11B *15/02, 7/00*

U.S. Cl. 369—48 **6 Claims**



1. A circuit arrangement for a disk player of the type arranged to reproduce information prerecorded in a disk in the form of pits, where said information has been recorded as a modulated signal obtained by modulating a carrier wave, said circuit arrangement comprising:

(a) first means responsive to both a lower sideband signal and an upper sideband signal of a reproduced signal from said disk, for producing a control signal indicative of the difference between the levels of said lower sideband signal and said upper sideband signal; and

(b) second means for changing the frequency characteristic of said reproduced signal in accordance with said control signal.

4,509,156

SEMICONDUCTOR LASER DRIVING SYSTEM

Shunji Ohara; Tomio Yoshida; Isao Satoh, all of Osaka, and Kenji Koishi, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 29, 1982, Ser. No. 445,273

Claims priority, application Japan, Dec. 1, 1981, 56-193971

Int. Cl.³ G11B *7/00, 27/36*

U.S. Cl. 369—54 **4 Claims**

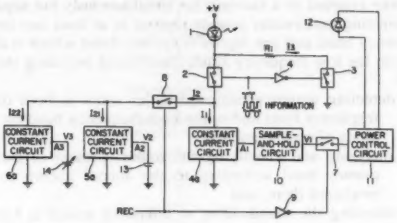
1. An optical recording and reproducing device of the type in which the laser light emitted from a laser is used to write and read on and off a recording medium data represented in binary coded signals or binary digits "0s" and "1s", comprising,

(a) a photosensor for sensing or monitoring the power of a laser beam emitted from said laser in the read or reproduction mode in which the binary coded data are recorded on said recording medium,

(b) a laser light power control circuit which is responsive to the output from said photosensor for maintaining the read or reproduction current applied to said laser at a predetermined level,

(c) a first gate means for disabling said laser light power control circuit in the write or recording mode in which binary coded data or information are recorded on said recording medium,

(d) a sample-and-hold circuit for sampling and holding said



read or reproduction current immediately before said write or recording mode is initiated,

(e) a constant current circuit for providing a predetermined level of the write or recording current,

(f) a second gate means for superposing the write or recording current on said read or reproduction current sampled and held in said sample-and-hold circuit immediately before the binary coded data are recorded on said recording medium, and for providing the current thus superposed to said laser, and

(g) a third gate means for switching said superposed write or recording current on and off in response to the binary digits "0s" and "1s".

4,509,157

DISC PLAYER APPARATUS WITH AN IMPROVED DISC CLAMPER

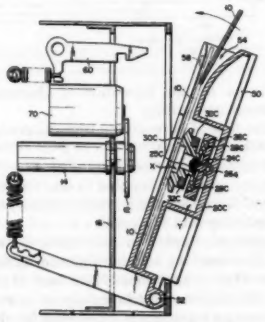
Kaoru Morinaga, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 16, 1982, Ser. No. 398,926

Claims priority, application Japan, Jul. 20, 1981, 56-113254

Int. Cl.³ G11B *17/04, 3/62*

U.S. Cl. 369—75.2 **31 Claims**



1. A clamper for a disk player apparatus comprising:

turntable means for receiving a disc to be played back;

clamp means for engaging and holding the disc against said turntable means and between said turntable means and said clamp means when said clamp means is in a first

position and for permitting the removal of the disc from the turntable means when said clamp means is in a second position;

support means positioned opposite said turntable means for rotatably and slidably supporting said clamp means, said clamp means being slidable along a direction running from said support means to said turntable means and, when said clamp means is in said first position, said clamp means being mechanically free from said support means;

electromagnetic force means fixed solely to said clamp means and said support means for selectively clamping said clamp means against and releasing said clamp means from said turntable means;

means for selectively supplying a first current to said electromagnetic means, said first current causing said electromagnetic means to generate an electromagnetic force which urges the clamp means toward said turntable means so that the clamp means engages and clamps the disc against said turntable means; and

means for selectively supplying a second and opposite current to said electromagnetic means, said second current causing said electromagnetic means to generate an electromagnetic force which urges the clamp means away from said turntable means so that the clamp means is spaced from said turntable means.

4,509,158

DISC LOADING DEVICE IN A VIDEO DISC PLAYER

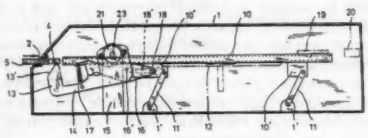
Seong S. Kang, 394-84 Anyang-dong, Anyang-city, Gyunggi-do, Rep. of Korea

Filed Jan. 27, 1983, Ser. No. 461,397

Claims priority, application Rep. of Korea, Feb. 13, 1982, 82-628

Int. Cl.³ G11B *25/04*

U.S. Cl. 369—77.2 **1 Claim**



1. A disc loading device used in video disc player in which a turntable is held rotatably at a certain position, comprising;

a caddy-receiving plate having a caddy-receiving plate opening through which said turntable can be protruded and having at both lateral edges a guide means extended longitudinally and adapted to guide horizontally a caddy into said plate;

a driving mechanism provided at each side of said plate adjacent to a caddy-inserting opening and including a bracket mounted fixedly to the bottom of a body of the player, a first operating means mounted to said bracket for rotating according to insertion of the caddy into said caddy-inserting opening and formed with a cam adjacent to said caddy-inserting opening, said cam having an inclined surface facing towards said caddy-inserting opening and contacting with the proceeding end of the caddy at insertion of the caddy, a damper mounted to the connection between said bracket and the first operating means, and a second operating means mounted pivotally to said first operating means and adapted to transmit the movement thereof to the plate;

a linkage mechanism connected to both sides of said plate and driving mechanism and adapted to change a rotational movement from said driving mechanism into an upward and downward movement of the plate, whereby the plate is movable upwardly and downwardly, while being maintained horizontally, between a position lifted to be in a common plane with said caddy-inserting opening to permit the caddy to be inserted into the plate at insertion of the caddy into said caddy-inserting opening and a position lowered to permit the disc to be seated on the turntable at removal of the caddy from said caddy-inserting opening;

said second operating means being connected at one end to said first operating means by means of a coil spring and at the other end to the caddy-receiving plate by means of a pin mounted fixedly to said other end of the second operating means and a slot formed at a support member connecting the plate and the linkage mechanism.

4,509,159

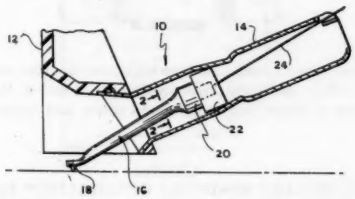
ALUMINUM-ALUMINUM OXIDE STYLUS ARM

George Alexandrovich, Commack; J. Raymond Edinger, Uniondale; Alan Hofer, Wantaugh, and John Kuykendall, Nesconset, all of N.Y., assignors to Pickering & Company, Inc., Plainview, N.Y.

Filed Dec. 6, 1982, Ser. No. 447,128

Int. Cl.³ G11B *3/02*; H04R *11/12*

U.S. Cl. 369—170 **4 Claims**



1. A phonographic stylus assembly comprising: a hollow arm formed of a non-magnetic metallic material; a jeweled stylus affixed to one end of said arm and a magnetic element mounted to said arm opposite said jeweled stylus; said arm having an anodized skin extending inwardly for substantially one-half the thickness of said arm from the outer surface toward the interior surface thereof, said skin comprising an oxide of said metallic material; a non-magnetic, electrically conducting tube surrounding said arm; and an electrically conducting tie wire electrically connecting the interior surface of said arm with said tube.

4,509,160

DISC DRIVE ASSEMBLY

Fred S. Eggers, 3961 Altadena La., San Jose, Calif. 95127

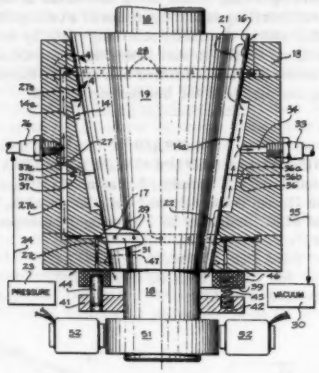
Filed Dec. 5, 1983, Ser. No. 558,320

Int. Cl.³ G11B *3/36*; F16C *32/06*

U.S. Cl. 369—269 **8 Claims**

1. In a disc drive assembly of a type employing a rotating disc having a record surface thereon for carrying information and means for transducing the information with respect to said record surface, means supporting said disc for rotation on an axis extending normal to the disc through the center thereof to cause tracks of information to be disposed thereon concentrically of the center of the disc, the last named said means including a shaft carrying said disc and journal body means carried by said shaft, said journal body means being formed with a sloping side, an air bearing assembly including a bearing housing, said housing having top, bottom and side walls defining a hollow interior, tapered openings formed respectively through said top and bottom walls, the side walls of said openings sloping downwardly and radially inwardly to receive said journal body means nested therein, the slope of the side wall of said openings corresponding to the slope of that portion of said journal body means disposed adjacent thereto, and means forming air passages interposed between said body and said side walls of each opening to discharge air under positive pressure to supply an air lubricated bearing around those portions of said journal body means nested in said openings, a hollow cavity formed within said housing disposed between

said openings, said cavity serving to define a manifold disposed about an intermediate portion of said body, means coupling a



vacuum pump to said cavity to withdraw air from said manifold to draw said body downwardly against said air lubricated bearings to axially center said body within said housing.

4,509,161

OPTICALLY READABLE INFORMATION DISC PROVIDED WITH A REFLECTIVE OPTICAL STRUCTURE

Renaat E. Van de Leest, and Jan C. Gijsbers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 17, 1982, Ser. No. 378,570

Claims priority, application Netherlands, Feb. 4, 1982, 8200415

Int. Cl.³ G11B *5/62*; G01D *15/34*

U.S. Cl. 369—275 **4 Claims**

1. An optically readable information disc comprising a substrate plate provided on one side or on both sides with a reflective optical structure provided with reflective layer composed of a nitride, carbide or boride of a transition metal selected from the group consisting of titanium, zirconium, hafnium, vanadium, chromium, niobium, molybdenum, lanthanum, tantalum and tungsten.

4,509,162

HIGH DENSITY RECORDING MEDIUM

Marshall D. Rester, Anaheim, Calif., assignor to Quixote Corporation, Chicago, Ill.

Continuation of Ser. No. 201,554, Oct. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 64,177, Aug. 6, 1979, , which is a continuation-in-part of Ser. No. 43,429, May 29, 1979,. This application Dec. 13, 1982, Ser. No. 449,489

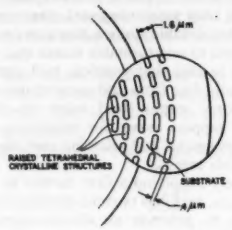
Int. Cl.³ G11B *7/00, 5/82*

U.S. Cl. 369—275 **15 Claims**

1. A high density recording medium comprising:

a substrate having a surface;

an array of microscopic structures deposited on the surface of the substrate along a reading axis, each of the structures extending above the surface and defining deflection surfaces tilted with respect to the surface to divert an incident



beam of radiation wherein information is recorded in the pattern of the structures along the reading axis.

4,509,163

PROCESS FOR PRODUCING A LOW HYGROSCOPIC METHACRYLIC RESIN AND INFORMATION RECORDING SUBSTRATES MADE THEREFROM

Kazumasa Kamada, Hiroshima; Katsumi Tamai, Otake; Yasunori Shimomura, Otake, and Kazunori Abe, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,616

Claims priority, application Japan, Jun. 29, 1982, 57-112038

Int. Cl.³ C08F *220/14*

U.S. Cl. 369—284 **5 Claims**

1. An information recording substrate comprising a low hygroscopic methacrylic resin of a water absorption rate of no greater than 1.4% comprising copolymerized monomers consisting essentially of 50–85% by weight methyl methacrylate, 15–50% by weight cyclohexyl methacrylate and 0–30% by weight of a third monomer selected from the group consisting of methyl acrylate, ethyl(meth)acrylate, butyl(meth)acrylate, lauryl(meth)acrylate, stearyl(meth)acrylate, 2-ethylexyl(meth-)acrylate, ethylene glycol di(meth)acrylate, tetraethylene glycol di(meth)acrylate, trimethylol ethane tri(meth)acrylate, trimethylol propane tri(meth)acrylate, pentaerythritol tetra(-meth)acrylate, allyl(meth)acrylate and styrene.

4,509,164

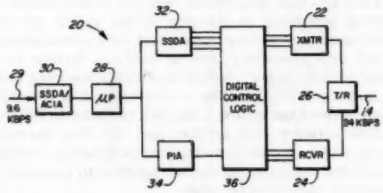
MICROPROCESSOR BASED DIGITAL TO DIGITAL CONVERTING DATASET

Hussein T. Mouftah, Kingston, Canada, assignor to Queen's University at Kingston, Ontario, Canada

Filed Nov. 30, 1981, Ser. No. 325,967

Int. Cl.³ H04M *11/00*

U.S. Cl. 370—29 **40 Claims**



1. Digital to digital converting communication interface for providing high speed, full duplex, burst mode communication of fixed length data blocks comprising:

(a) transmitting means and receiving means for transmitting and receiving data;

(b) mode switching means responsive to a mode switching signal for alternately connecting said transmitting means

and said receiving means to a communication path having a two-wire line;

(c) programmable microprocessor control means for causing said mode switching means to alternate between transmit and receive modes when a complete fixed length data block has been transmitted or received;

(d) first adaptor means addressably connectable to said programmable microprocessor control means for communicating data at a first rate and in a first format with said programmable microprocessor control means and for communicating said data at a second rate and in a second format with said transmitting means and said receiving means;

(e) digital control logic means for generating a plurality of control signals to control operation of said interface, and for causing said data to be communicated at said second rate and in said second format between said first adaptor means and said transmitting means and said receiving means;

(f) second adaptor means interfacing said programmable microprocessor control means with said digital control logic means; and

(g) third adaptor means for connecting data terminating equipment to said programmable microprocessor control means.

4,509,165

MINIATURIZED ANTENNA DUPLEXER USING SAW FILTER

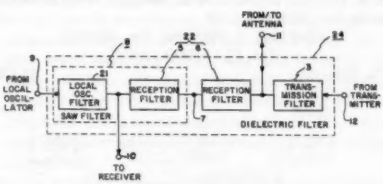
Yoshiharu Tamura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1982, Ser. No. 452,388

Claims priority, application Japan, Dec. 22, 1981, 56-192325[U]

Int. Cl.³ H03H 9/00; H04B 1/40

U.S. Cl. 370—38 **10 Claims**



1. An antenna duplexer comprising:

first filter means for a local oscillation frequency, said first filter means being comprised of a first surface acoustic wave filter;

second filter means for a reception frequency, said second filter means having first and second sections, said first section being coupled to said first filter means and being comprised of a second surface acoustic wave filter, said second section having low susceptibility to burnout at the voltage of a transmission signal;

third filter means for the frequency of said transmission signal, said third filter means being coupled to said second section; and

antenna means coupled between said second section and said filter means.

4,509,166

PCM COMMUNICATION SYSTEM AND METHOD OF OPERATION

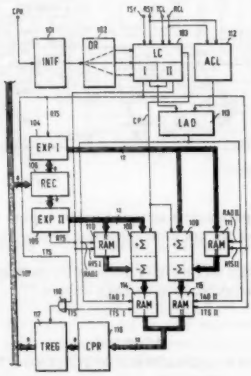
Joachim W. Simon, Goslar, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Fed. Rep. of Germany

Division of Ser. No. 233,816, Feb. 12, 1981, Pat. No. 4,449,217. This application Nov. 4, 1983, Ser. No. 503,421

Claims priority, application Fed. Rep. of Germany,

Int. Cl.³ H04J 3/00

U.S. Cl. 370—62 **11 Claims**



1. A circuit for PCM conference communications between conference-connected stations of the type having a processing circuit (**104–116**) connected by way of a receiver (**106**) or a transmitter (**117**) to a multiplex line (**107**) of a PCM time-division multiplex communication network, an expander circuit (**104,105**) for linearizing the received PCM signals, an adder-subtractor unit (**108,109**) with summing registers and a compressor circuit (**116**) for delinearizing the PCM signals to be transmitted, temporary stores (**110,111**) and means (**113**) for producing control signals and relative address signals, time-slot sequence clock signals, time-slot synchronizing clock signals and relative addresses received from the central processing unit, wherein the improvement comprises:

a processing channel (**110–115**) in the processing circuit (**104–116**) between receiver (**106**) and transmitter (**117**), said processing channel (**110–115**) comprising parallel-connected receiving storage registers (**110,111**) and adder-subtractor units (**108,109**), each of which include an adder section and a subtractor section, the subtractor section being connected to the outputs of the receiving storage registers (**110, 111**) and transmitting storage registers (**114,115**) connected to the parallel-connected registers (**110,111**).

4,509,167

DATA CONFERENCE ARRANGEMENT

Richard G. Bantel, West Allenhurst, N.J., and Diane E. Herr, Warrenville, Ill., assignors to AT&T Bell Laboratories, Murray Hill and American Bell, Inc., Holmdel, both of, N.J.

Filed Aug. 5, 1983, Ser. No. 520,690

Int. Cl.³ H04Q 11/04

U.S. Cl. 370—62 **9 Claims**

1. For use in an arrangement for conferencing a plurality of data terminals via a conference bridge, a method for establishing a set of communication parameters for each of a plurality of data terminals engaged in a conference comprising the steps of:

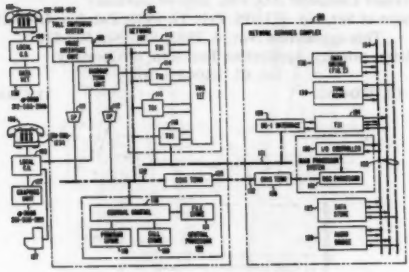
ascertaining a first set of parameters of a first data terminal connected to the bridge,

assigning to the bridge said first set of parameters,

informing a second data terminal requesting connection to the bridge of the parameters assigned to the bridge,

ascertaining a second set of parameters assigned to said second data terminal,

comparing the second set of parameters with the parameters assigned to the bridge,



altering the parameters assigned to the bridge to conform to said second set upon concurrence of said first data terminal and,

connecting said second data terminal to the bridge when said assigned parameters have been altered.

4,509,168

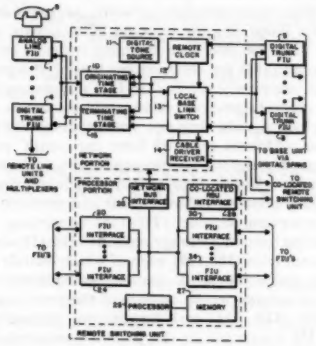
DIGITAL REMOTE SWITCHING UNIT

Robert E. Renner, Glendale, Ariz., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Nov. 3, 1983, Ser. No. 548,481

Int. Cl.[3] H04Q *11/04*

U.S. Cl. 370—63 **24 Claims**



1. In a telecommunications system, a remote switching unit is connected between subscribers and other switching systems via a plurality of interface equipment, said remote switching unit comprising:

first and second PCM buses connected to said subscribers via said interface equipment for transmitting a plurality of PCM data samples;

third and fourth PCM buses connected to said other switching systems via said interface equipment for transmitting a plurality of PCM data samples;

digital span means connected between said plurality of interface equipment and said other switching system and being operated to transmit said PCM data samples between said remote switching unit and said other switching systems;

first and second originating time switching means, each of said originating time switching means being operated to switch said PCM samples received from said interface equipment, said first and second originating time switching means being connected to said interface equipment via said first and second buses respectively;

first and second space switching means, each including:

first latching means connected to said corresponding first and second originating time switching means, said first latching means being operated in response to said subsequently transmitted PCM samples to store said PCM samples during each time slot;

first multiplexing means connected to said first latching means and being operated to transmit said stored PCM samples during each time slot in response to a first and a second operating signal of first predefined values; and

second latching means connected to said first multiplexing means and being operated to store said PCM samples transmitted through said first multiplexing means during each time slot;

selecting means connected to said first multiplexing means, to said first latching means, and to said interface equipment via said third and fourth PCM buses, said selecting means being operated to receive and to transmit said PCM data samples from said other switching systems during each time slot;

said first multiplexing means being further operated, in response to said received PCM data samples of said other switching systems, to transmit said received PCM samples during particular time slots in response to said first and second operating signals of second predefined values;

said selecting means being further operated in response to said stored PCM samples of said first latching means to transmit said stored PCM samples to said interface equipment via said third and fourth PCM buses for transmission through said digital span means; said remote switching unit further comprising:

first and second terminating time switching means being connected respectively between said first and said second space switching means via said second latching means and said interface equipment, said first and second terminating time switching means respectively operated to switch said PCM samples from said first and second space switching means to said interface equipment for transmission to said subscribers.

4,509,169

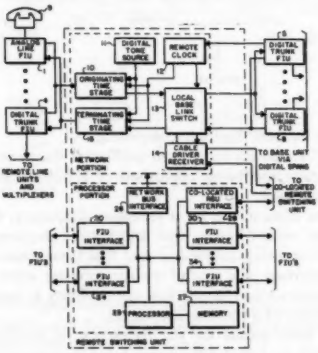
DUAL RAIL NETWORK FOR A REMOTE SWITCHING UNIT

Robert E. Renner, Glendale, Ariz., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Nov. 3, 1983, Ser. No. 548,483

Int. Cl.[3] H04Q *11/04*

U.S. Cl. 370—63 **31 Claims**



1. In a remote switching arrangement, a remote switching unit is connected between subscribers and other switching

systems via a plurality of interface equipment, said remote switching unit comprising:

first and second PCM buses connected to said subscribers and to said other switching systems via said interface equipment for transmitting a plurality of PCM data samples;

first and second originating time switching means, each of said originating time switching means being operated to switch said PCM samples from said interface equipment, said first and second originating time switching means being connected to said interface equipment via said first and second buses respectively;

each of said originating time switching means including:

first and second memory means connected to each of said first and second PCM buses, said first and said second memory means being interconnected so that said first and said second memory means are written into simultaneously corresponding time slots with said transmitted PCM samples;

said first and said second memory means further being capable of being operated so that said PCM samples transmitted on said first bus may be switched from said second bus for subsequent retransmission or alternatively said PCM samples transmitted on said second bu may be switched to said first bus for subsequent retransmission;

said remote switching unit further comprising:

first and second space switching means, said first and second space switching means each including:

first latching means connected to said corresponding first and second originating time switching means, said first latching means operated in response to said subsequently transmitted PCM samples to store said PCM sample during each time slot;

first multiplexing means connected to said first latching means and operated to transmit said stored PCM samples during each time slot in response to first and second operating signals of first predefined values; and

second latching means connected to said multiplexing means and being operated to store said PCM samples transmitted through said multiplexing means during each time slot;

said remote switching unit further comprising:

first and second terminating time switching means being connected respectively between said first and said second space switching means and said interface equipment, said first and second terminating time switching means respectively operated to switch said PCM samples from said first and second space switching means to said interface equipment for transmission to telephone subscribers;

each of said terminating time switching means including:

first and second memory means connected between said second latching means and said interface equipment, said first and said second memory means being interconnected so that said first and said second memory means are written into simultaneously in corresponding time slots for storing said PCM samples stored in said second latching means;

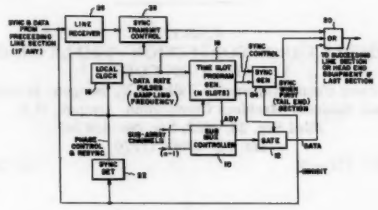
said first and said second memory means further being capable of being operated to switch said PCM samples from said first space switching means through said second terminating time switching means to said telephone subscribers or alternatively being capable of being operated to switch said PCM samples from said second space switching means through said first terminating time switching means to said telephone subscribers.

4,509,170

TIME DIVISION MULTIPLEX TRANSMISSION OF SUBMULTIPLEX SEQUENCES OF SIGNALS FROM SECTIONS OF A CHAIN OF DATA ACQUISITION UNITS

David P. Hollinger, Kendall; David E. Nelson, and Robert J. Hannon, both of Rochester, all of N.Y., assignors to Hydroacoustics Inc., Rochester, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,903
Int. Cl.³ H04J 3/06
U.S. Cl. 370—85 **15 Claims**



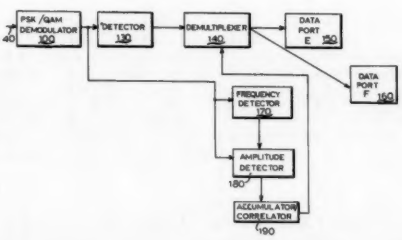
1. In a telemetry system having a plurality of sections at which data is time division multiplexed and transmitted to a receiving point, the improvement comprising means for each of said sections for generating a sequence of time slots for transmissions of signals from all of said sections, means for each of said sections responsive to the reception of signals from a preceding section for synchronizing said time slots generated therein, with the time slot sequence of said preceding section in the sequence in which said sections are connected to each other, and means in each of said sections for the transmission of signals therefrom and from said preceding section or sections in time division multiplex relationship in different ones of said time slots.

4,509,171

MODEM MULTIPLEXER SYNCHRONIZATION BY RADIAL MODULATION

Gordon Bremer, Clearwater, and William L. Betts, Madeira Beach, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Dec. 8, 1982, Ser. No. 447,988
Int. Cl.³ H04J 3/06
U.S. Cl. 370—100 **4 Claims**



1. A digital data transmission system employing a QAM or PSK technique of sending concurrently a first series of bits consisting of bits A and a second series of bits consisting of bits B comprising:

a transmitter which transmits symbols X1, Y1, X2, Y2, wherein each of said X symbols corresponds to a first 3-bit group of the form ABA and each of said Y symbols corresponds to a second 3-bit group of the form BAB wherein said bits A are bits from said first series of bits and said bits B are bits from said second series of bits and wherein each

of said X and Y symbols are characterized by a radius R and R′ respectively; and

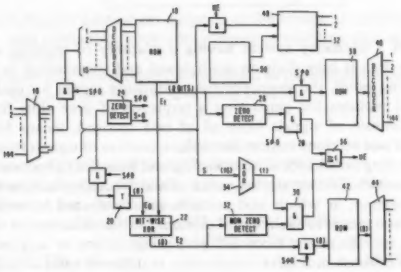
a receiver which receives a series of received symbols corresponding to said transmitted symbols, and is adapted to separate the series of received symbols into said first series and said second series of bits by determining the radii of every other received signal, correlating the radii of a preselected number of symbols to obtain a correlated value, and generating a synchronizing signal dependent on said correlated value.

4,509,172

DOUBLE ERROR CORRECTION - TRIPLE ERROR DETECTION CODE

Chin-Long Chen, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 28, 1982, Ser. No. 424,940
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—38 **11 Claims**



1. In an error correction system having a double bit error correction and triple bit error detection code for a memory in which bits of memory code words are divided into N memory packages of M bits per package, modularized error correction apparatus for correcting package errors including:

encoder means for encoding data words into said code words for storage in said memory using a double error correction and triple error detection code characterized by an H matrix substantially as shown below

H =

1	2	3			
1.11	1.11	11.1	.111	11.1	..11
....	11..	1.1.	1..1	1..1	..1.
11..	....	....	1..1	....	.111
11.1	.11.	1.1.	...1	..11	1111
1...	1..1	1..1	.1..	1111	...1
1..1	1111	1111	11..	.1.1	.111
1.1.	...1	1...	1.1.	...1	1111
....	..1.	1.11	..1.	.11.	..11
111.	1..1	...1	..1.	..1.	1.1.
.111	....	..11	..11	..11	1...
....	.11.	...1	.11.	1...	11.1
..11	..11	.111	.1.1	.111	.1..
.1..	.11.	11..	1.11	....	111.
.1..	1111	111.	111.	..11	.111
.1.1	.111	.1..	11.1	...1	.111
...1	1..1	.1.1	..11	1..1	1..1
1...	.1..	.11.	.1.1	1111	11..
1.1.	11..	.1..	.1..	.111	1...
111.	.111	1...	..1.	.1..	..11
.111	11..	..11	1...	...1	1.1.
.1.1	11.1	..1.	.1.1	.1.1	.1..
1..1	1..1	....	.1..	..1.	..1.
.1..	1.1.	.11.	1..1	..1.	1.11
.111	....	.1.1	....	.111	11.1
.11.	111.	.1..	.111	1111	11.1
1111	1..1	.1.1	1111	..11	1.11

-continued

...1	.11.	..1.	.11.	..11	11..
.11.	...1	1.1.	11.1	.11.	.1..
11..	1.1.	1...	1111	..11	111.
1.1.	.111	1111	1...	1.11	.11.
....	.111	....	1.11	1.1.	1.1.
..11	1...	1..1	..11	1.11	11.1
..11	1.11	.11.	.111	.1..	.1..
..1.	..11	1.11	1.11	.111	111.
.1..	1111	1.1.	.11.	..1.	111.
.1..	1111	.1..	1.1.	.11.	1..1
.111	11..	1...	.1.1	..11	.1.1
1111	.1..	1...	....	1.1.	.111
11.1	1..1	1..1	111.	1111	..11
.111	.1..	..1.	..11	.11.	...1
....	11.1	1.1.	1..1	.1..	1.11
.1.1	.1.1	1.1.	..1.	1..1	111.
....	11.1	11.1	.111	1.11	1...
111.	11..	..11	..1.	1...	.111
1..1	.11.	..1.	..11	11.1	.1..
.11.	..1.	1...	111.	1111	.1.1
..1.	1...	.11.	1111	....	111.
1.1.	.111	.1.1	1.11	.1..	.111
1...	1...	1...	111.	11..	.111
...1	....	1.11	.11.	.11.	..1.
11..	1..1	1..1	.1.1	1...	..11
1..1	..11	.111	1.11	..11	11..
..1.	1.1.	11.1	..1.	....	...1
1..1	.1..	..1.	11..	111.	1...
....	..11	.11.	.111	1111	11..
.1..	11..	1111	.111	1.11	.1..
..1.	..1.	.11.	111.	....	....
111.	111.	11..	1...	...1	1.1.
1...	1..1	111.	1.11	..1.	1...
.1..	....	11..	11..	..1.	.111
11..	.1.1	1111	1..1	1.11	1...
.11.	1...	...1	1..1	..1.	..1.
11.1	.111	.111	..1.	1111	111.
1.11	..11	.1.1	.1..	..11	.1.1
11..	..11	.111	..11	1.1.	1...
1..1	1..1	11..	11.1	..1.	1.11
1..1	111.	1.11	11..	...1	11..
1.11	111.	1..1	1111	...1	.1..
1111	..1.	1.1.	1..1	1111	..1.
1...	.111	111.	.1.1	111.	1..1
..1.	...1	..11	1.1.	1...	1...
.111	11..	11.1	..1.	....	.1.1
.111	11.1	..1.	.1..	.111	1.11
1...	..1.	..11	....	1...	..11
1...	11.1	.111	111.	1..1	...1
1.11	....	..11	.1..	..1.	..11
....	..11	..11	1111	.1..	..1.
.1.1	.1.1	..1.	11..	1...	111.
1.11	.1.1	.1..	..11	.11.	11.1
1...	..11	..11	1...	....	1..1
	32	33	34	35	36
11..	...1	1...	....	....	....
..1.	.11.	.1..	....	....	....
1111	1111	..1.	....	....	....
.111	.111	...1	....	....	....
1...	.1.1	....	1...	....	....
.1.1	.11.	....	.1..	....	....
.1..	.111	....	..1.	....	....
1...	11.1	....	...1	....	....
11.1	11..	....	....	1...	....
1.11	1.1.	....	....	.1..	....
.1..	1.1.	....	....	..1.	....
1..1	111.	....	....	...1	....
..11	.1..	....	....	....	1...
11.1	1...	....	....	....	.1..
.1..	1.1.	....	....	....	..1.
1..1	11.1	....	....	....	...1

syndrome generation means for generating syndrome S from a codewords read from said memory,

decode means responsive to the output of said syndrome generation means for identifying all possible single bit error syndromes of said codeword and all possible double bit error syndromes of said codeword; and

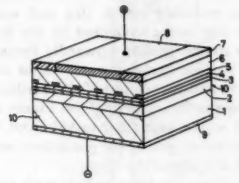
means to determine the location of any single or double bit errors once they are identified by said decode means.

4,509,173

PHASE-LOCKED SEMICONDUCTOR LASER DEVICE

Jun-ichi Umeda, Hachioji; Hisao Nakashima, Tokorozawa; Takashi Kajimura, Hachioji, and Takao Kuroda, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1982, Ser. No. 366,324
Claims priority, application Japan, Apr. 15, 1981, 56-55547
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—50 **12 Claims**



1. A semiconductor laser device comprising:
a semiconductor substrate having first and second major surfaces;
a semiconductor assembly for optical confinement having a first major surface formed on said first major surface of said semiconductor substrate, said semiconductor assembly including an active layer, a first cladding layer formed on a side of said active layer which faces toward said semiconductor substrate and a second cladding layer formed on a side of said active layer which faces away from said semiconductor substrate;
a first electrode formed on a second major surface of said semiconductor assembly; and
a second electrode formed on said second major surface of said semiconductor substrate,
wherein said semiconductor assembly further includes a plurality of regions which are optical absorption regions of an optical absorption layer formed in said semiconductor assembly between said second cladding layer and said first electrode which optical absorption regions cause a variation of a complex refractive index for a laser beam in a direction intersecting with a traveling direction of the laser beam such that local emissions of adjacent laser regions formed by said plurality of optical absorption regions give rise to a non-linear interaction therebetween.

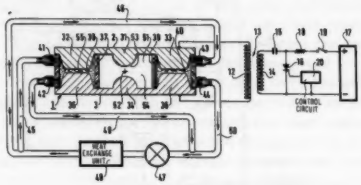
4,509,174

CAPACITOR DISCHARGE EXCITED GAS LASER

Bernard Lacour, Marcoussis; Marc Maillet, Massy; Chantal Vannier, Saint Michel sur Orge, and Olivier de Witte, Gif sur Yvette, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Jan. 12, 1983, Ser. No. 457,536
Claims priority, application France, Jan. 14, 1982, 82 00526
Int. Cl.³ H01S *3/097*
U.S. Cl. 372—82 **5 Claims**

1. A capacitor discharge excited gas laser comprising:
a pair of metal plates which face each other, with each plate having oppositely facing a middle portion situated between two adjacent end portions;
a pair of dielectric members disposed between said pair of plates on either side of said middle portions and in contact with said end portions to form, together with the plates, two parallel connected capacitors, the space between said dielectric members and said plates constituting a channel having an axis and containing a gaseous active medium, and the middle portions of the plates which are in contact with the active medium forming respective electrodes;
a resonant optical cavity disposed along the axis containing the active medium; and
a charging circuit comprising:
a transformer having a primary winding connected in series with a capacitance, and a secondary winding having its ends connected to respective ones of said plates;
a source of electric current capable of charging said capacitance; and



means for causing the capacitance to discharge through the primary winding, thereby inducing a current in the secondary winding capable of charging said capacitors in order to establish an electric discharge between the electrodes, said discharge serving to excite the active gaseous medium to form a laser beam;
the improvement wherein each of said dielectric members comprises an insulating wall disposed perpendicularly to said plates and enclosing a volume between the corresponding pair of facing end portions, and water filling said enclosed volume.

4,509,175

SEGMENTED YAG LASER RODS AND METHOD OF MANUFACTURE

Richard T. Daly, and Martin G. Cohen, both of Huntington, N.Y., assignors to Quantronix Corporation, Smithtown, N.Y.

Filed Sep. 14, 1982, Ser. No. 418,023
Int. Cl.³ H01S *3/08*
U.S. Cl. 372—101 **9 Claims**

1. In a laser rod, which comprises a plurality of rod segments joined to each other by optical cement the improvement comprising: each surface of adjacent ends of the segments having a radius or figure, the interposed cement having a predetermined refractive index and is in the configuration of a lens for compensation of dynamic focusing.

4,509,176

LONGITUDINAL-DISCHARGE-PULSE LASER WITH PREIONIZATION OBTAINED BY CORONA EFFECT

Renato Marchetti, and Eugenio Penco, both of Rome, Italy, assignors to Selenia Industrie Elettroniche Associate S.p.A., Rome, Italy

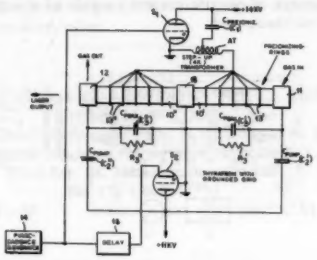
Filed Jun. 15, 1982, Ser. No. 388,590
Claims priority, application Italy, Jun. 17, 1981, 48705 A/81
Int. Cl.³ H01S *3/097*
U.S. Cl. 372—86 **7 Claims**

1. In a longitudinal-discharge-pulse laser comprising:
two coaxial sections formed by a pair of glass tubes joined together by a grounded central electrode and terminated by two outer electrodes;
an ionizable gas mixture in said glass tubes;

a multiplicity of metal rings spacedly surrounding each of said glass tubes;

a pulse-cadence generator periodically emitting a series of command pulses;

first electronic switch means connected to said generator for emitting a steep negative preionizing pulse to all said metal rings simultaneously in response to each command pulse,



thereby giving rise to a corona effect in a zone encompassed by each metal ring with resulting preionization of said gas mixture; and

second electronic switch means connected via a delay circuit to said generator for simultaneously emitting a negative trigger pulse to said outer electrodes in response to each command pulse, thereby initiating a pumping discharge in said sections.

4,509,177

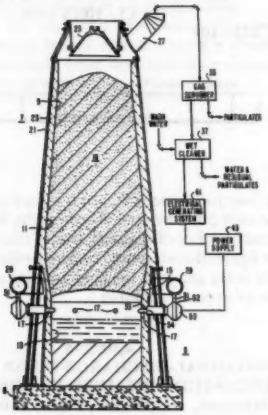
ELECTRIC ARC-FIRED BLAST FURNACE SYSTEM

Maurice G. Fey, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 29, 1983, Ser. No. 509,121

Int. Cl.³ F27B *1/26*

U.S. Cl. 373—60 **8 Claims**



1. A blast furnace system for reducing metal ore contained in a burden to a metal, comprising:

blast furnace means having a refractory shell defining a vertical shaft, the upper, middle and lower regions thereof being the stack, bosh and hearth, respectively, the shaft containing the burden and products of reaction;

a tuyere having a nose end and a tail end, the nose end extending through the refractory shell and being in communication with the bosh;

means for injecting a gaseous mixture of pulverized carbon-containing fuel and an oxygen-containing gas into the bosh and comprising at least one electric arc heater;

the electric arc heater having an electrode and an arcing chamber, the electrode connected to a source of electricity to produce an electric arc in the arcing chamber;

inlet means communicating with the arcing chamber for introducing the gaseous mixture into the arcing chamber to form an arc-heated gas stream containing a reducing gas;

outlet means intermediate the arcing chamber and the tail end of the tuyere and communicating therebetween such that the arc-heated gas stream can pass therethrough for injection into the bosh to contact the burden, the arc-heated gas stream reacting with the burden, the products of reaction including metal, slag and water vapor, the metal and slag being collected in the hearth, the arc-heated gas stream passing upwardly through the burden entraining particulates and water vapor and causing the prereduction and preheating of the burden in the stack;

gas uptake means for receiving the excess arc-heated gas stream and water vapor exhausted from the top of the shaft, the upstream end of the gas uptake means communicating with the top of the shaft;

gas scrubber means communicating with the downstream end of the gas uptake means for cleaning the gases exhausted from the blast furnace means of substantially all entrained particulates and water vapor;

a gas compressor, the inlet being in communication with the outlet of the gas scrubber means, the gas compressor compressing the cleaned gases exiting the gas scrubber means;

a combustion turbine, the inlet being in communication with the outlet of the gas compressor, the compressed gases being combusted therein to rotate the output shaft of the turbine;

an electric generator connected to the output shaft of the turbine such that rotation of the turbine output shaft causes the electric generator to produce electricity for use by the electric arc heater;

a heat exchanger having primary and second sides, with the secondary side containing a heat transfer medium, the primary side inlet being in communication with the gas outlet of the combustion turbine, the hot products of combustion passing from the combustion turbine into the primary side wherein they are cooled by the transfer of their heat to the secondary side medium causing the vaporization thereof with the cooled products of combustion being vented out the primary side outlet; and

a compressor turbine, the gas inlet and outlet thereof being in communication with the secondary side outlet and inlet, respectively, of the heat exchanger, the vaporized secondary side medium entering therethrough to cause the rotation of the output shaft of the turbine while condensing therein, the cooled secondary side medium being recirculated into the heat exchanger with the output shaft of the compressor turbine being connected to and driving the gas compressor.

4,509,178

ARRANGEMENT OF AN ELECTRODE FOR ELECTRIC ARC FURNACES

Hans Lades, Schwaig; Friedrich Fink, Lauf a. d. Pegnitz; Siegfried Liebel, Röthenbach; Inge Lauterbach, Nuremberg; Thomas Taube, Erlangen-Steudach, and Dieter Zöllner, Schwaig, all of Fed. Rep. of Germany, assignors to Arc Technologies Systems Ltd., Cayman Islands

Filed Apr. 21, 1983, Ser. No. 487,119

Claims priority, application Switzerland, Apr. 23, 1982, 2503/82

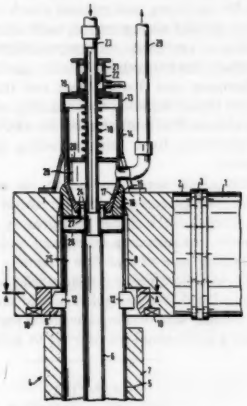
Int. Cl.³ H05B *7/07*

U.S. Cl. 373—93 **10 Claims**

1. An electrode and electrode support arrangement for use in an electric arc furnace, the electrode having a metallic, cooled

upper section to which a lower section of consumable material is attached, the electrode support arrangement having a movable arm and having connections for supplying electric current and coolant to the electrode, and comprising;

coolant receiving means at the upper section of said electrode for press connecting with coolant supply means, said receiving and supply means being pressably interengaged within said electrode support arm;



electric current receiving means at said upper electrode section for press connecting with current supply means, said receiving and supply means being pressably interengaged within said electrode support arm; and

mechanical fastening means engaging said upper electrode section with said support arm, said electrode section and support arm being thereby mechanically interengaged within said electrode support arm.

4,509,179

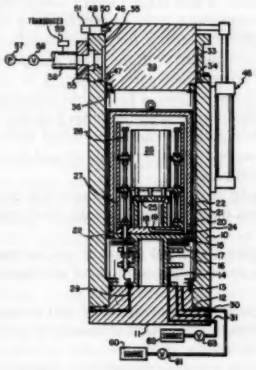
VACUUM SINTERING AND HOT ISOSTATIC PRESSING IN THE SAME VESSEL

Franz X. Zimmerman, Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.

Filed Sep. 27, 1983, Ser. No. 536,313

Int. Cl.³ F27B *1/26*

U.S. Cl. 373—109 **7 Claims**



1. An apparatus for heating a workpiece at elevated temperatures both under vacuum and under superatmospheric pressures comprising:

(a) a vacuum pressure vessel comprising a cylindrical pressure shell having an inner cylindrical sealing face near the upper edge thereof and a cover at one axial end and a bottom plug at the other axial end, both arranged to be placed within a reaction frame bearing thereupon;

(b) a furnace within the shell having an insulating hood for protecting the shell from the heated workspace;

(c) a vacuum manifold mounted to the top edge of the cylindrical shell and being sealed thereto, said manifold having a cylindrical interior through which the cover passes and an inner cylindrical sealing face at the upper end thereof;

(d) mechanically powered means for raising and lowering the cover and placing it in a first or a second position;

(e) means associated with the cover providing an interior vacuum seal between the cover and the inner cylindrical sealing face on the manifold when the cover is in the first position, and forming an interior pressure seal with the inner cylindrical sealing face on the cylindrical shell when the cover is in the second position; and

(f) a port in the manifold exposed to the interior of the vessel when the cover is in the first position, said port having a cross sectional area of at least eight square inches.

4,509,180

METHOD AND AN APPARATUS FOR CORRECTING DISTORTION OF BINARY RECEIVED SIGNALS

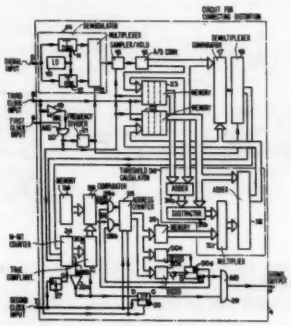
Norbert Neyer, Zurich, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Nov. 4, 1982, Ser. No. 439,328

Claims priority, application Switzerland, Mar. 15, 1982, 1604/82

Int. Cl.³ H03K *5/20*

U.S. Cl. 375—76 **8 Claims**



1. An apparatus for correcting a signal for distortion by means of threshold value comparisons, said signal having a sequence of binary "1" and "0" bits modulated on a carrier, and wherein the distortion has been impressed on said signal during passage through a transmission channel,

comprising in combination

signal demodulation means for demodulating the signal,

sampling means for sampling the demodulated "1" and "0" bits each an equal number of times during a bit duration, including hold means for holding the sampled signal substantially at the sampled value, and wherein the sampled "0" bits form initial threshold values, and the sampled "1" bits form demodulated signal values,

analog-to-digital converter means postcoupled to said sampling means for quantizing the sampled values,

a first memory for storing the quantized initial threshold values,

a second memory for storing the quantized demodulated values,

a threshold calculator for calculating from the stored and quantized demodulated signal values and from the stored and quantized initial threshold values revised threshold values,

a first comparator for comparing the quantized demodulated signal values with corresponding of said revised threshold values, and for deciding whether the sampled signal value is a "1" value or a "0" value,

quality factor determining means for determining the quality factor of a detected bit including

storage means for storing a reference quality factor,

a second comparator connected to said storage means for arriving at a decision whether said quality factor of a detected bit exceeds or falls below said reference quality factor in dependence of the output of said first comparator, and of said storage means,

read only memory means having address locations with variable contents, and

means for changing the contents of said address locations in dependent of the decision of said second comparator, and for feeding a series of parameters to said treshold calculator in dependence of the changed contents of said address locations.

4,509,181

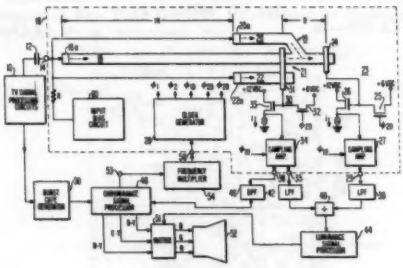
CCD CHARGE SUBSTRACTION ARRANGEMENT

Donald J. Sauer, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 28, 1982, Ser. No. 383,302

Int. Cl.[3] **G11C** *19/28;* **H03H** *7/30*

U.S. Cl. 377—63 **4 Claims**



1. Apparatus for subtracting a first signal from a second signal, comprising:

first and second charge transfer channels formed on a substrate;

a plurality of gates overlying said first channel for storing and transferring charge packets representative of said first signal therein;

a plurality of gates overlying said second channel for storing and transferring charge packets representative of said second signal therein;

means for applying a first clock signal to gates overlying said first channel, the storage of a charge packet under a clocked gate being initiated when said first clock signal transgresses a first threshold level and transfer of a charge packet out from beneath a clocked gate being initiated when said first clock signal transgresses a second threshold level;

means for applying a second clock signal opposite in phase to said first clock signal to gates overlying said second channel, the storage of a charge packet under a clocked gate being initiated when said second clock signal transgresses said first threshold level and transfer of a charge packet out from beneath a clocked gate being initiated when said second clock signal transgresses said second threshold level;

a floating gate overlying both said first and second channels, between preceding and succeeding gates of each of said channels;

means for periodically clamping and unclamping said floating gate to a reference potential when the level of a clamp signal transgresses a third threshold level in first and second directions, respectively; and

means for applying said second clock signal to said clamp means as said clamp signal, said second clock signal including an amplitude excursion which sequentially transgreses said third threshold level in said second direction for unclamping said floating gate and then transgresses said second threshold level for initiating a transfer of a charge packet in said second channel to transfer under said floating electrode from said preceding gate of said second channel;

said first clock signal including an amplitude excursion which transgresses said first threshold level at a time after said second clock signal transgresses said second threshold level, for initiating storage of a charge packet in said succeeding gate of said first channel;

whereby said floating electrode senses a subtractive combination of said charge packet of said second channel transferred under said floating electrode and said charge packet of said first channel transferred to said succeeding gate.

4,509,182

BINARY COUNTER

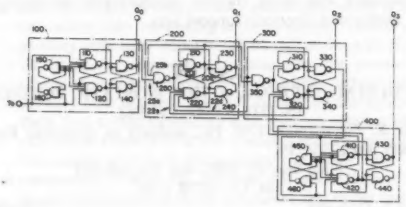
Hiroshi Minakuchi, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 2, 1982, Ser. No. 384,173

Claims priority, application Japan, Jun. 4, 1981, 56-86465; Aug. 13, 1981, 56-127644; Nov. 16, 1981, 56-183567

Int. Cl.[3] **H03K** *23/08, 21/06, 21/10*

U.S. Cl. 377—116 **2 Claims**



1. A binary counter, a unit stage thereof comprising:

a first pair of coincidence gates consisting of a first and a second coincidence gates, a first input terminal of each gate being cross-coupled with the other's output terminal;

a second pair of coincidence gates consisting of a third and a fourth coincidence gates, a first input terminal of each gate being cross-coupled with the other's output terminal;

a fifth coincidence gate, an output terminal thereof being coupled with second input terminals of said first and said second coincidence gates;

means for supplying an output signal of said first coincidence gate to a second input terminal of said third coincidence gate;

means for supplying an output signal of said second coincidence gate to a second input terminal of said fourth coincidence gate;

means for supplying an output signal of said second pair of coincidence gates to third input terminals of said first and said second coincidence gates;

means for supplying a trigger signal from a preceding unit stage to a first input terminal of said fifth coincidence gate;

means for supplying the output signal of said first coinci-

dence gate to a second input terminal of said fifth coincidence gate;

means for supplying, as a trigger signal, the output signal of said first coincidence gate to a next unit stage; and

means for supplying output signals of a next first and a next second coincidence gates which constitute the next unit stage to a fourth and a fifth input terminals of said second coincidence gate, respectively.

4,509,183

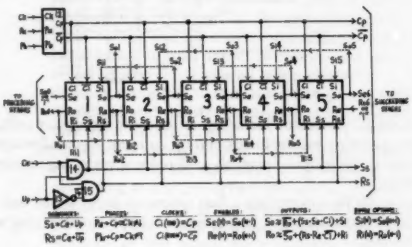
BIDIRECTIONAL TRANSITION COUNTER WITH THRESHOLD OUTPUT

Fred R. Wright, San Pedro, Calif., assignor to Helene R. Wright, San Pedro, Calif.

Filed Sep. 16, 1982, Ser. No. 418,694

Int. Cl.³ H03K *23/04, 23/08;* **G11C** *19/28*

U.S. Cl. 377—125 **6 Claims**



1. A transition counter comprising a plurality of three or more counting elements arranged in a linear array;

each of said counting elements including a bistable latch having one or more input means for "setting" said latch to one of its bistable states, and one or more input means for "resetting" said latch to the other one of its bistable states, and output means for signaling the existing "set" or "reset" bistable state of said latch and thus of the counting element, said "setting" and "resetting" input means to be normally maintained in logic states other than those which induce "set" or "reset" output results;

each of said counting elements having input means for a signal indicating the bistable state of the preceding counting element, and input means for a signal indicating the bistable state of the succeeding counting element, and input means for a signal indicating whether a "setting" count sequence is to occur, and input means for a signal indicating whether a "resetting" count sequence is to occur, and input means for a common clocking signal of effectively complementary logic polarity to adjacent counting elements;

each of said counting elements including first conditional gating means whereby a "setting" signal is applied to the bistable latch during the specific conditions where said "setting" count sequence is indicated, and the signal from the preceding counting element indicates that it is "set", and said common clocking signal is in a preselected logical state;

each of said counting elements including second conditional gating means whereby a "resetting" signal is applied to the bistable latch during the specific conditions where said "resetting" count sequence is indicated, and the signal from the succeeding counting element indicates that it is "reset", and said common clocking signal is in a logical state opposite to said preselected logical state;

the counter being constructed and defined such that each consecutive counting element is permitted to "set" at the clocking transition following the "setting" of the preceding counting element during a "setting" count sequence, or to "reset" at the clocking transition following the "resetting" of the succeeding counting element during a "resetting" count sequence, and wherein a change from one count sequence to the other becomes effective at the next clocking transition;

a threshold is manifest at that point along the array where all preceding counting elements are "set" and all succeeding counting elements are "reset";

said threshold progressing by one counting element in the "setting" or the "resetting" direction on each clocking transition during the appropriate count sequence, thus effectively progressing by two counting elements for each clocking cycle, and producing the sequence of counting states RRR, SRR, SSR, SSS during "setting", or SSS, SSR, SRR, RRR during "resetting", thereby exhibiting one more counting state than the number of counting elements composing the array.

4,509,184

STEREO SOUND SYSTEM

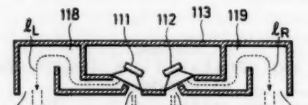
Hirofumi Yanagawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 478,943

Claims priority, application Japan, Mar. 26, 1982, 57-43660[U]

Int. Cl.³ H04R *5/00*

U.S. Cl. 381—24 **7 Claims**



1. A stereo sound system for reproducing signals from two indlependent channels, comprising:

right and left speakers;

center means for summing in phase and attenuating the acoustic outputs of said right and left speaker and radiating said summed attenuated signals; and

right and left acoustic tunnels having input ends facing at least a portion of said right and left speakers respectively and sound issuing ends located on the right and left sides respectively of said center means, said tunnels delaying signals propagating from said input ends to said sound issuing ends.

4,509,185

TIME DOMAIN AUDIO PANNER

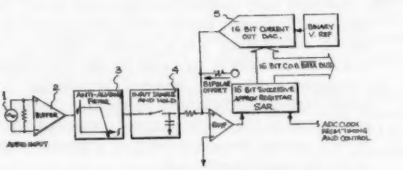
Robert M. Grunberg, 15 Fairfax Rd., Bellevue Hill, N.S.W., 2023, Australia

Filed Jul. 25, 1983, Ser. No. 512,136

Claims priority, application Australia, Aug. 9, 1982, PF5284/82

Int. Cl.³ G11B *13/00*

U.S. Cl. 381—34 **3 Claims**



1. A time domain panner, comprising a control means, a single analogue audio input signal source, a buffer, an anti-aliasing filter, a sample-and-hold circuit, an analogue-to-digital

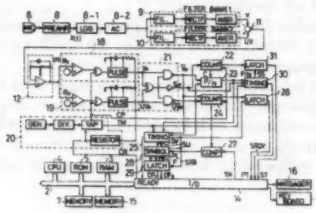
converter, a memory array, an address counter, a digital-to-analogue converter, said source being connected via said buffer, said anti-aliasing filter and said sample-and-hold circuit to said analogue-to-digital converter, said analogue-to-digital converter being for digitizing a sampled audio input into a PCM representation which is fed as an input to said memory array which has a plurality of memory locations, a multiplexer which feeds said memory array and which continuously cycles in response to said address counter which repetitively counts to a maximum count, whereby address words produced by said address counter may address said array with or without add words and a selected channel of said multiplexer points to a value established by said address counter plus an offset, thereby time-shifting selectively analogue output signals provided from left and right analogue output channels with respect to said analogue input signal and with respect to each other, said analogue output signals being obtained from said array via said digital-to-analogue converter, and means for processing said audio signal, said means for processing comprising a variable filter having controllable transfer characteristics which are a function of said control means.

4,509,186

METHOD AND APPARATUS FOR SPEECH MESSAGE RECOGNITION

Koichi Omura, Osaka, and Hiroyoshi Yuasa, Hirakata, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Dec. 31, 1981, Ser. No. 336,055
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—43 **48 Claims**



1. A speech message recognizing method wherein a speech message is analyzed into a plurality of frequency bands, energies contained in respective said frequency bands are measured and a frequency band distribution of said energies is compared with reference patterns to recognize the contents of said speech message, said method comprising the steps of:

(a) logarithmically compressing the amplitude of said speech message,

(b) analyzing said amplitude-compressed speech message into a first frequency band in which the energies of voiced sounds concentrate, and a second frequency band in which the energies of unvoiced sounds concentrate,

(c) obtaining a difference between the energies of voiced sound components belonging to said first frequency band and the energies of unvoiced sound components belonging to said second frequency band to generate voiced and unvoiced sound signals, and

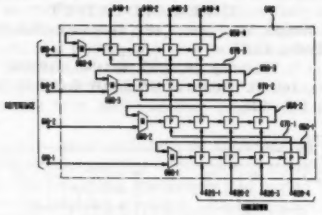
(d) comparing said voiced and unvoiced sound signals with respective said reference patterns to extract one of the reference patterns which is substantially identical to the signals.

4,509,187

TIME WARP SIGNAL RECOGNITION PROCESSOR USING RECIRCULATING AND/OR REDUCED ARRAY OF PROCESSOR CELLS

Bryan D. Ackland, East Windsor; David J. Burr, Tinton Falls, both of N.J., and Neil H. E. Weste, Durham, N.C., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 14, 1982, Ser. No. 388,033
Int. Cl.³ G06K *9/64*; G10L *1/00*
U.S. Cl. 381—43 **10 Claims**



1. A signal processor including an array of processor cells, pattern matching means for extending an input signal through said cells to an output terminal, said pattern matching means including:

first means for comparing a first unknown input signal having m elements and a first reference input signal having n elements,

first means for time warping either of said first input signals with respect to the other of said first input signals, and

diagonal control means coupled to said first comparing means for controlling cells on a first predetermined diagonal of said array of cells characterized in that said processor further comprises

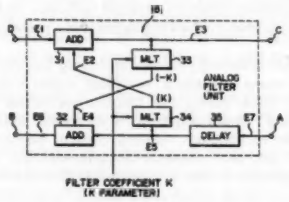
means for recirculating either of said input signals through said cells according to a predetermined methodology, said recirculating means including means for extending signals from an output of first periphery predetermined ones of said cells to an input of second periphery predetermined ones of said cells, said recirculated signals being extended for processing by said second cells.

4,509,188

SIGNAL SYNTHESIZER APPARATUS

Seigo Suzuki, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 259,207, Mar. 30, 1981, Pat. No. 4,403,295. This application Jun. 16, 1983, Ser. No. 504,747
Claims priority, application Japan, Apr. 3, 1980, 55-43868
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—53 **2 Claims**



1. A signal synthesizer apparatus including a parameter dependent multiplier utilizing a charge transfer device whose multiplicative coefficient is determined by a prescribed parameter, said signal synthesizer apparatus comprising:

input means including an input electrode for storing an input charge corresponding to an input signal applied to said parameter dependent multiplier;

transmission means coupled to said input means for selectively transferring charges of said input charge, the selectivity of said transmission means being dependent on said prescribed parameter; and

output means for receiving charges transferred from said transmission means and providing an output signal corresponding to the received charges,

wherein said input charge represents only said input signal, and

said transmission means comprises:

charge divide means located in a charge-transferring path between said input means and said output means for selectively dividing said input charge into given fragments and transferring the divided fragments of charge to said output means, said charge divide means includes a plurality of transfer electrodes, each of said transfer electrodes stores a part of the given fragments of said input charge and has a given capacitance less than the capacitance of said input electrode, said given fragments of said input charge being obtained by charge-dividing according to the ratio of the given capacitance of each of said transfer electrodes to the capacitance of said input electrode; and

determination means coupled to said charge divide means for determining the selectivity of the dividing of charge according to said prescribed parameter, with the rate of the dividing of charge corresponding to said multiplicative coefficient, said determination means including a plurality of first transmission switches coupled respectively to said transfer electrodes for enabling operation of said transfer electrodes, and designation means coupled to said first transmission switches for designating which one of said first transmission switches enables operation of a corresponding one of said transfer electrodes.

4,509,189

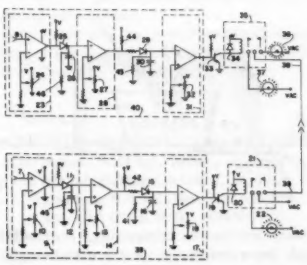
SOUND LEVEL INDICATING DEVICES

Buddy B. Simpson, Rte. 1 Box 320-A, Woodland, Ala. 36280

Filed Jun. 8, 1983, Ser. No. 502,195

Int. Cl.³ G08B *5/36, 23/00;* **G01H** *3/12*

U.S. Cl. 381—56 **3 Claims**



1. A sound level indicating device to give a visual signal automatically to indicate the decibel level of noise being detected, with said signal being sustained for the duration of the noise level being detected, and for changing the visual signal a multiplicity of times to indicate predetermined levels of noise as being acceptable or at higher levels with said device comprising in combination: a microphone for detecting noise and generating a voltage potential in response to the detection of said noise; a first stage audio amplifier coupled with said microphone by means of an RC coupling for amplifying the output of said microphone with a fixed gain; and a second stage audio amplifier coupled with said first stage audio amplifier by means of an RC coupling for amplifying the output of said first stage audio amplifier with adjustable gain by means of an array of resistors and a rotary switch to allow the operator to choose different decibel levels of noise as being acceptable; a first series of cascading threshold detector circuits comprised of: a first threshold detector circuit coupled to an output of said second stage audio amplifier for converting the erratic signal from said second stage audio amplifier into a square wave indicative of when the level of noise exceeds a threshold value said first threshold detector including variable threshold setting means for changing the sensitivity of said device when predetermined the decibel level of noise to be indicated as acceptable; a second threshold detector circuit coupled to said first threshold detector circuit by means of a filter comprised of a diode and an appropriate RC timing circuit the second threshold detector gives a sustained signal to indicate detection of a decibel level of noise by said microphone which has been predetermined to be acceptable, the second threshold detector alternately gives a signal indicating detection of a noise level above the acceptable level for at least a set period of time; a third threshold detector circuit coupled to said second threshold detector circuit by means of a second filter comprised of a second diode and an appropriate second RC timing circuit, the third threshold detector gives a sustained signal indicating an acceptable noise level unless the signal from the second threshold detector indicating a noise level above the acceptable level persists for an additional set period of time; an SPDT relay; a transistor coupled with said third threshold detector circuit for switching the SPDT relay in response to the sustained signal from the third threshold detector, to supply A/C current to a lamp bulb which glows to indicate the noise level being detected by said microphone is within a decibel level which has been predetermined to be acceptable.

4,509,190

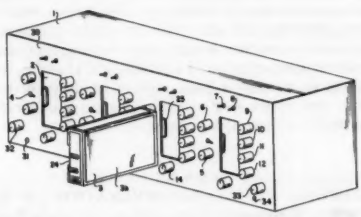
EFFECTS BOX SYSTEM AND METHOD

Abner Spector, 250 174th St. #1904, Miama Beach, Fla. 33160

Continuation-in-part of Ser. No. 479,869, Mar. 29, 1983, abandoned, which is a continuation of Ser. No. 150,813, May 19, 1980, Pat. No. 4,388,490. This application Sep. 27, 1983, Ser. No. 536,368

Int. Cl.³ H04R *3/12*

U.S. Cl. 381—61 **65 Claims**



1. An audio signal processing system for rapidly attaining a large number of different sounds resulting from facile insertion and removal of audio effects circuits into and from a live main audio path of said system, said system having an incoming source audio signal, said system being linkable to and operable in the audio path of any device adapted to receive an audio signal processing device, comprising:

at least one cartridge for containing said audio effects circuit and contact elements thereof serving as cartridge contact elements, said cartridge contact elements including at least one audio input and at least one audio output, whereby said audio output provides the audio effects;

a main housing having a system input terminal for connecting the incoming source audio signal to the audio path and having a system output terminal, said main housing further having at least one cartridge-receiving recess adapted

to removeably receive said cartridge, said recess having recess contact elements adapted to correspondingly engage said cartridge contact elements when said cartridge is installed in said recess, said recess contact elements including at least one audio input and at least one audio output being respectively associated with said main audio path; and

at least one recess bypass switching means associated with the main audio path and said recess for providing a bypass mode of operation wherein said bypass mode provides for electrically disconnecting said main audio path from said recess in a manner that provides for routing the audio path and, as a matter of course, the incoming source audio signal by said recess, and

for providing an operative mode of operation wherein said operative mode provides for electrically connecting said audio path to said recess in a manner that provides for routing said audio signal to and from said recess via and through the audio effects circuit of a cartridge installed therein;

so that said modes can provide for avoiding spurious signals that can be generated into said audio path by the making or breaking of electronic contact between some of said corresponding contact elements while providing means for maintaining the continuity of said main audio path by,

with respect to insertion of the audio effects circuit into said main audio path, first, before said insertion, placing said recess bypass switching means in said bypass mode of operation until, at a point reached during installation of said cartridge into said recess, stabilized electronic contact has been established between said corresponding contact elements, whereupon the placing of said switching means in said operative mode of operation can provide for noiselessly directing said audio signal to flow into and out of said recess via and through the audio effects circuit of the cartridge installed therein, while maintaining the continuity of said main audio path, and

with respect to removal of the audio effects circuit from said audio path, by again first, before said removal, placing said recess bypass switching means in said bypass mode of operation, providing thereby, for noiselessly directing said audio signal to flow to said recess before disturbance to said stabilized electronic contact between said corresponding contact elements is caused by said removal, while maintaining the continuity of said main audio path;

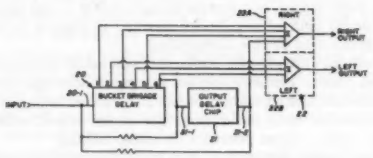
whereby insertion and removal of the audio effects circuits into and from said main audio path can be accomplished in a manner permitting rapid and noiseless changing of said circuits to provide a large number of different sounds, while said system is in operation, while maintaining the continuity of said main audio path.

4,509,191

ELECTRONIC STEREO REVERBERATION DEVICE

Neil A. Miller, Newtonville, Mass., assignor to Scholz Research & Development, Waltham, Mass.

Filed Sep. 20, 1982, Ser. No. 420,281
Int. Cl.³ H04R *3/00*
U.S. Cl. 381—63 **7 Claims**



1. An electronic reverberation device for providing reverberation to signals in the audio frequency range, comprising:

an input terminal and a pair of output terminals corresponding to right and left stereo output signals, respectively;

an analog delay device having an input coupled from said input terminal for receiving an input audio signal and including a plurality of successive output taps separated into at least first and second output tap groups with at least some of the output taps of the first group being timewise interleaved with output taps of the second group;

said successive output taps having a delay period defined therebetween with at least some of said delay periods being of different length than an adjacent delay period;

a feedback path coupling from at least one of said output taps of said analog delay device to said analog delay device input;

first and second summing devices each having multiple inputs and an output;

means coupling the output taps of the first group only to the inputs of the first summing device;

means coupling the output taps of the second group only to the inputs of the second summing device;

means coupling the output of each of the summing devices to one of the pair of output terminals;

said summing devices for summing the signals inputted thereto to provide two different audio output signals having different delay components,

an output delay circuit having an input and an output and means coupling the input thereof from an output tap of the analog delay device,

said feedback path including a first feedback path coupled from the output tap that couples to the output delay circuit to the analog delay device input and a second feedback path that couples from the output of the delay circuit to the analog delay device input,

means coupling the output of the output delay circuit to only one of said summing devices at an input thereto,

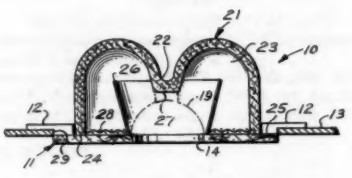
wherein each output delay tap is connected to provide an input to only one summing device.

4,509,192

SPEAKER ENCLOSURE

Roy D. Straughn, 5021 Muldoon Cir., Pensacola, Fla. 32506

Filed Apr. 7, 1983, Ser. No. 482,848
Int. Cl.³ H04R *1/28;* **G10K** *13/00*
U.S. Cl. 381—90 **1 Claim**



1. A speaker enclosure, comprising, in combination, a square-shaped, plywood panel, a circular central opening through said panel, a circular row of secondary openings through said panel being located concentrically around an outer side of said central opening, a concentric, circular ring thus being formed between said central opening and said secondary openings, and a spoke portion formed between each said secondary opening, and extending radially outwardly from said ring; a circular, hollow, fiberglass dome mounted on a rear side of said panel, and forming a closed chamber on a rear side of said central and secondary openings; a central portion of said dome being inwardly concaved a part distance toward said panel, a speaker inside said chamber having a front side mounted on said ring, and a rear side thereof engaging said concaved central portion of said dome, a frusto-conical baffle around a side of said speaker being mounted at one end on said

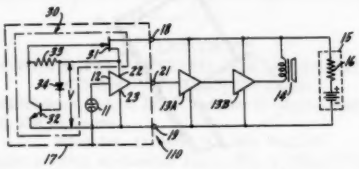
rear side of said panel, and extending divergingly rearwardly inside said chamber, and a galvanized wire screen covering an inner side of said secondary openings being bonded to a metallic coating on an inner peripheral surface of said dome.

4,509,193

MINIATURE ACOUSTICAL TRANSDUCER WITH FILTER/REGULATOR POWER SUPPLY CIRCUIT

Elmer V. Carlson, Prospect Heights, Ill., assignor to Industrial Research Products, Inc., Elk Grove Village, Ill.

Filed Jul. 11, 1983, Ser. No. 512,352
Int. Cl.³ H04M 1/03
U.S. Cl. 381—113 **17 Claims**



1. In a miniature acoustical transducer system suitable for use in hearing aids and like applications, of the kind comprising a microphone connected to the signal input of an amplifier, the amplifier having first and second power terminals connected to a battery, the improvement comprising a combined filter and voltage regulator circuit interposed between the battery and the first power terminal of the amplifier, the filter/regulator circuit comprising:

a first semiconductor gate device having input, output, and control electrodes, the input electrode of the first gate device being connected to the battery and the output electrode of the first gate device being connected to the first power terminal of the amplifier;

a second semiconductor gate device having input, output, and control electrodes, the input electrode of the second gate device being connected to the second power terminal of the amplifier and to the battery and the output electrode of the second gate device being connected to the control electrode of the first gate device;

a resistance connected between the output and control electrodes of the first gate device;

and a junction diode connected between the output electrode of the first gate device and the control electrode of the second gate device;

the junction diode and the control electrode-input electrode junction of the second gate device each having a highly non-linear voltage/current characteristic.

4,509,194

APPARATUS FOR PRODUCING A CODE WORD

John A. Harrington, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

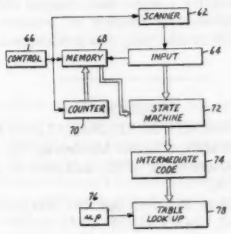
Filed Sep. 9, 1982, Ser. No. 416,138
Int. Cl.³ G06K 9/00; H04N 1/00
U.S. Cl. 382—56 **8 Claims**

1. An apparatus for producing a code word, said apparatus responsive to the binary information content in an information bearing document defined by a predetermined number of picture elements in each of a plurality of horizontal lines in said document, said apparatus receiving said binary information content sequentially from said picture elements in each one of said plurality of lines and sequentially through said plurality of lines, said code word being indicative of the vertical correlation between a change in the binary information content of sequential picture elements in a current one of said plurality of lines with a change in the binary information content of said picture elements in a prior one of said plurality of lines, comprising:

picture element counting means receiving said binary information content, said picture element counting means for counting said predetermined number of picture elements;

memory means operatively coupled to said picture element counting means, said memory means for storing the binary information content of said predetermined number of picture elements in said prior one of said plurality of lines;

a state machine receiving as inputs the binary information content of a current one of said predetermined number of picture elements and operatively coupled to said memory means, said state machine for determining a change in the binary information content of said predetermined number of picture element in said prior one of said plurality of lines and for moving from state to state depending upon the vertical correlation of said change binary information content in said prior one of said plurality of lines with a change in the binary information content in the line containing said current one of said predetermined number of picture elements; and



output means responsive to said state machine, said output means for outputting said code word depending upon the vertical correlation of a change in the binary information content of said picture elements between said prior one of said plurality of lines and the line containing said current one of said predetermined number of picture elements;

said state machine being responsive as current inputs only to said current one of said predetermined number of picture elements, to the binary information content of a corresponding one of said picture elements in said prior one of said plurality of lines corresponding to said current one of said predetermined number of picture elements and to the binary information content of picture elements in said prior one of said plurality of lines which are sequentially ahead of said corresponding one of said picture elements, said state machine using said current inputs to determine its internal state and using said current inputs and its internal state to determine said code word.

4,509,195

PROCESS AND DEVICE FOR THE BINARIZATION OF A PATTERN

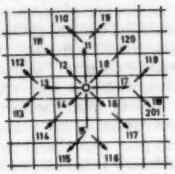
Morton Nadler, 17 Les Huppes, 78170 La Celle Saint Cloud, France

Filed Dec. 28, 1981, Ser. No. 334,468
Claims priority, application United Kingdom, Jan. 5, 1981, 8100094
Int. Cl.³ G06K 9/38, 9/36
U.S. Cl. 382—51 **10 Claims**

5. A device for the binarized evaluation of a pattern from a signal indicative of intensity values of spatially distributed discrete points of said pattern, wherein said device comprises:

means for registering the intensity values of points distributed in at least two concentric rings around each elementary area of successively scanned elementary areas, at least in one sector centered on said elementary area, determining contrast values each equal to the difference of the registered intensity values between a point of an inner ring and a point of an outer ring, and assigning a positive and

negative difference sign to respectively the positive and negative contrast values thus determined having an absolute value higher than a predetermined contrast threshold, means for counting distinctively said positive and negative difference signs in the vicinity of said elementary area and



means for assigning a light or dark quality to said elementary area respectively when said counted difference signs contain a predominant number of positive or negative difference signs comforming to a predetermined minimum condition.

4,509,196

TAMPER-INDICATING SELF-SEALING POUCH

Dennis A. Sak, Hinsdale; Thomas Mestetsky, St. Charles, and Stanley Manne, Glencoe, all of Ill., assignors to Arvey Corporation, Chicago, Ill.

Filed Jun. 30, 1983, Ser. No. 509,861
Int. Cl.³ B65D *33/20, 77/12, 33/34*
U.S. Cl. 383—5 **15 Claims**

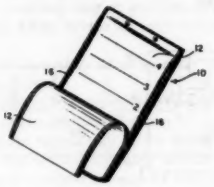
1. A tamper-indicating, self-sealing pouch, comprising:
first and second generally coextensive webs at least partially marginally joined together to define the interior of said pouch;
access opening means defined by said pouch for providing access to the interior of said pouch comprising an elongated access opening defined by said first pouch web; and
laminate adhesive sealing means on said pouch in association with said opening means for closing and sealing said access opening means, said adhesive sealing means comprising a laminate of adhesive carrier means having first and second adhesive means on opposite sides thereof, said first adhesive means being adhered to said first of said pouch webs for maintaining said laminate adhesive means on said pouch, and said second adhesive means being adapted to effect the closing and sealing of said access opening means such that if said access opening means is opened after being closed and sealed by said second adhesive means, said laminate adhesive means delaminates to indicate opening;
said laminate adhesive means being positioned on said first web on opposite sides of said access opening such that said pouch can be folded to bring said second adhesive means into confronting relation with itself to effect closing and sealing of said access opening with an adhesive-to-adhesive seal.

4,509,197

WINDOW BAG FOR LIQUIDS

Florren E. Long, Mount Vernon, Ohio, assignor to Ludlow Corporation, Needham Heights, Mass.

Filed Sep. 29, 1982, Ser. No. 427,190
Int. Cl.³ B65D *33/04*
U.S. Cl. 383—106 **9 Claims**



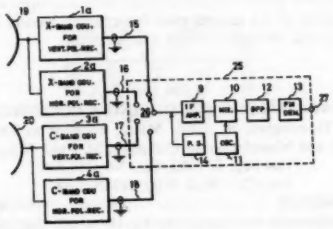
1. A heat-sterilizable flexible pouch suitable for use in retort packaging, said pouch comprising:
(a) a first opaque barrier ply, heat-sealed about its periphery to
(b) a first side of a transparent window ply, which is in turn heat-sealed about its periphery on its second side to
(c) a second opaque barrier ply and wherein the minimum seal strength of the seal between (a) and (b) is over about 2000 grams per inch and the maximum peel strength of the seal between plys (b) and (c) is below the seal strength between (a) and (b).

4,509,198

SATELLITE BROADCAST SIGNAL RECEIVING SYSTEM

Akihiko Nagatomi, Kobe, Japan, assignor to DX Antenna Company, Limited, Kobe, Japan

Filed Sep. 22, 1982, Ser. No. 421,083
Claims priority, application Japan, Oct. 19, 1981, 56-155916[U]
Int. Cl.³ H04N *7/16;* **H04B** *3/44*
U.S. Cl. 455—4 **3 Claims**



1. A broadcast signal receiving system comprising a plurality of outdoor receiving units for receiving a plurality of broadcast signals, and converting them into intermediate frequency signals in a common frequency band, an indoor unit having an input for receiving said intermediate frequency signals from a selected one of said outdoor units, switching means, a plurality of coaxial cables each coupling a respective outdoor unit to said switching means, means for connecting the input of said indoor unit to said switching means, said switching means selectively coupling one of said outdoor units through its associated coaxial cable to the input of said indoor unit via said

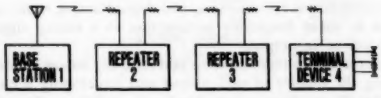
connecting means, a power supply coupled to the switching means for supplying operating power to said one outdoor unit through the associated coaxial cable, said switching means including conduction path means coupled through said coaxial cables to said outdoor units to supply said operating power thereto through the associated coaxial cables and additional conduction path means for feeding respective ones of said intermediate frequency signals from the associated outdoor units to said indoor unit through said coaxial cables and connecting means, said switching means selectively applying operating power to said one of said plurality of outdoor units, which selective power application enables a respective one of said additional conduction path means to close in order to feed said selected, respective intermediate frequency signal from the selectively powered outdoor unit to said indoor unit.

4,509,199

POWER SUPPLY SYSTEMS FOR USE IN RADIO COMMUNICATION SYSTEMS

Masaki Ichihara, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1983, Ser. No. 462,345
Claims priority, application Japan, Feb. 1, 1982, 57-14459
Int. Cl.³ H04B *1/60, 7/14*
U.S. Cl. 455—7 **7 Claims**



1. In a power supply system including one or more batteries for use in a radio communication system comprising a base station for transmitting and receiving radio signals, one or more repeater stations for repeating said radio signals, and a terminal station communicating with said base station through said one or more repeater stations, the improvement wherein said base station comprises means for transmitting synchronizing signal pulses at a predetermined period, and each of said one or more repeater stations and said terminal station comprise means, responsive to successive reception of a predetermined number of said synchronizing signal pulses, for effecting intermittent battery saving during intervals of time substantially equal to the period of said synchronizing signal pulses.

4,509,200

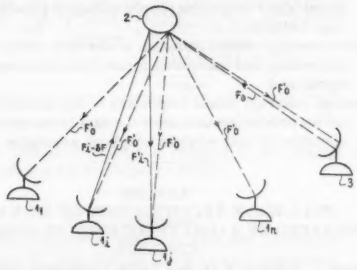
SATELLITE TELECOMMUNICATIONS SYSTEM

Pierre Luginbuhl; Alain Parnière, and Lazare Argintaru, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 23, 1983, Ser. No. 478,107
Claims priority, application France, Mar. 26, 1982, 82 05246
Int. Cl.³ H04B *7/185*
U.S. Cl. 455—12 **4 Claims**

1. A satellite telecommunications system comprising a central station and n peripheral stations communicating with one another, via a satellite, by the modulation of carrier waves, each peripheral station having an allocated frequency F_i of carrier wave, i=1 to n and in which the central station transmits to said satellite a signal F_o which retransmits a reference signal having a frequency F'_o to the peripheral stations, the satellite operating an algebraic addition of the received frequency F_o and of a frequency shift ΔF and imparting also a frequency drift δF variable in time,

wherein the central station comprises means for controlling said frequency F_o according to the frequency drift δF so that said frequency F'_o is stable in time, said means for controlling including a phase discriminator for evaluating the instantaneous frequency drift δF of the satellite supplying said signal, and means for modulating the reference frequency F_o with the thus evaluated instantaneous frequency drift δF, said means for modulating the reference frequency transmitted by the central station comprising an oscillator with controllable frequency having a control input connected to an output of said phase discriminator, said phase discriminator having two inputs which receives on one input a perfectly stable frequency supplied by a reference oscillator and on the second input the frequency



F'_o retransmitted by the satellite in response to the reference frequency F_o transmitted by the central station and converted by means of a frequency conversion stage; and

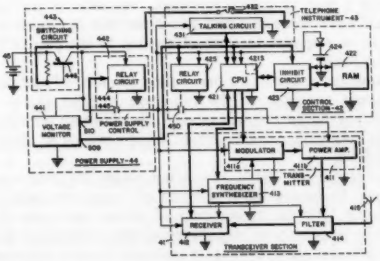
wherein each peripheral station comprises means for demodulating the instantaneous frequency drift δF of the satellite and, before transmission, algebraically substracting the instantaneous frequency drift δF of the satellite from the carrier frequency F_i allocated to said peripheral station.

4,509,201

WIRELESS TELEPHONE APPARATUS WITH PROTECTION AGAINST POWER LOSS

Tatsuaki Sekigawa; Akio Gotoh; Syuitsu Tsutsumi, all of Hachioji; Kuniyoshi Marui, Tokorozawa, and Naoto Honda, Hino, all of Japan, assignors to Toshiba Corporation, Kawasaki, Japan

Filed Jun. 23, 1983, Ser. No. 506,906
Claims priority, application Japan, Jun. 23, 1982, 57-108070
Int. Cl.³ H04B *1/40;* **H04M** *11/00*
U.S. Cl. 455—73 **11 Claims**



1. Wireless telephone apparatus for sending an outgoing telephone call and receiving an incoming telephone call, said wireless telephone apparatus comprising:

talking circuit means for generating the outgoing telephone call and receiving the incoming telephone call;

transmitter means for modulating a radio signal with the outgoing telephone call and for radiating the modulated radio signal;

receiver means for intercepting a radio signal modulated with the incoming telephone call and for demodulating the intercepted radio signal;

control means coupled to said talking circuit means, said transmitter means, and said receiver means for control-

ling, in accordance with control data, the operation of said wireless telephone apparatus;

power supply means for furnishing electrical power at a power supply voltage to said talking circuit means, said transmitter means, said receiver means and said control means;

monitor means coupled to said power supply means for generating a first alarm signal when the power supply voltage is beyond a first limit voltage and a second alarm signal when the power supply voltage is beyond a second limit voltage;

first interrupt means response to the first alarm signal for preventing said transmitter means from radiating the radio signal; and

second interrupt means responsive to the second alarm signal for preventing said control means from controlling the operation of said wireless telephone apparatus.

4,509,202

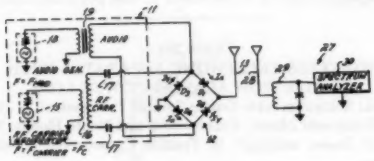
FULL-WAVE RECTIFICATION OF SIGNALS GENERATED BY RADIO FREQUENCY TRANSMITTING CIRCUITS

William L. Kingery, P.O. Box 12554, Cincinnati, Ohio 45212

Continuation-in-part of Ser. No. 249,197, Mar. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 135,729, Mar. 31, 1980, abandoned, which is a continuation of Ser. No. 894,745, Apr. 10, 1978, abandoned. This application Jun. 3, 1983, Ser. No. 500,979

Int. Cl.³ H04B *1/02*

U.S. Cl. 455—108 **1 Claim**



1. A modulated radio frequency signal transmitting circuit comprising:

a full-wave rectifier circuit, having a pair of input terminals and a pair of output terminals, operable to produce a full-wave rectified signal across the pair of output terminals in response to a signal applied to the pair of input terminals;

an antenna coupled to a first output terminal of said pair of output terminals of the full-wave rectifier circuit, the second output terminal of said pair of output terminals of the full-wave rectifier circuit being coupled to electrical ground;

radio frequency signal generating means for producing a radio frequency signal at a pair of output terminals, each output terminal of said pair of output terminals of the radio frequency signal generating means being coupled to a different input terminal of said pair of input terminals of the full-wave rectifier circuit; and

audio frequency signal generating means for producing an audio frequency signal at a pair of output terminals, each output terminal of said pair of output terminals of the audio frequency signal generating means being coupled to a different input terminal of said pair of input terminals of the full-wave rectifier circuit, the output terminals of the radio frequency signal generating means being connected in parallel with the output terminals of the audio frequency signal generating means, the audio frequency signal generating means producing an audio frequency signal having a greater amplitude than that of the radio frequency signal produced by the radio frequency signal generating means.

4,509,203

AUTO TUNING RECEIVER WITH A TUNING INFORMATION MEMORY

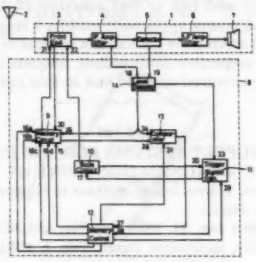
Shinji Yamada, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 23, 1982, Ser. No. 391,385

Claims priority, application Japan, Jun. 24, 1981, 56-98720

Int. Cl.³ H03J *7/18*

U.S. Cl. 455—166 **13 Claims**



1. A radio receiver system comprising:

receiver means for receiving and demodulating radio waves at an input frequency in response to a tuning signal to produce an output;

detector means responsive to said receiver means for detecting the quality of said output and developing a current digital quality level signal indicative of the quality of said output;

scanning means for providing said tuning signal to tune said receiver means to an input frequency within a desired range of frequencies;

memory means having a plurality of memory sections for storing a plurality of signals within said range of frequencies and their corresponding digital quality level signals in response to said scanning means;

means for comparing the current digital quality level signal with a stored digital level signal representing the weakest digital quality level; and for substituting the current digital quality level signal and its associated signal frequency for the level signal representing said weakest digital quality level and its associated frequency stored in said memory means when said current digital quality level signal exceeds the level of the quality signal representing said weakest digital level stored in said memory.

4,509,204

AM RADIO STOP DETECTOR

Donald T. Wile, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 23, 1983, Ser. No. 535,186

Int. Cl.³ H03J *7/18*

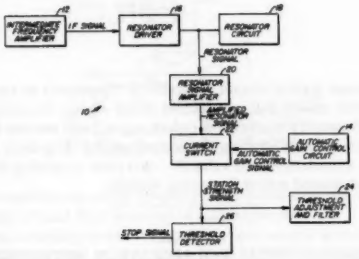
U.S. Cl. 455—169 **9 Claims**

1. An electronic circuit for use in an electronically tuned radio for issuing a stop signal, which radio includes receiver means for scanning the AM broadcast band and receiving broadcast signals at a receiver frequency, which receiver frequency is variable in discrete increments, which radio also includes intermediate frequency means for generating an intermediate frequency signal affected by modulation and having a frequency equal to a reference frequency when said receiver frequency substantially equals the broadcast frequency of a received broadcast signal and for generating said intermediate frequency signal having a frequency other than said reference frequency when said receiver frequency does not substantially equal the broadcast frequency of the received broadcast signal, which radio also includes an automatic gain control current having a magnitude that is proportional to the strength of the received broadcast signal, said circuit comprising:

(a) resonator drive means coupled to said intermediate frequency means for generating an oscillatory resonator signal current having a frequency equal to that of said intermediate frequency signal, and for removing effects of modulation on said IF signal;

(b) resonator circuit means coupled to said resonator drive means for converting said resonator signal current to a resonator signal voltage where the magnitude of the AC component of said voltage is inversely related to the difference between the frequency of said resonator signal current and said reference frequency;

(c) amplifier means coupled to said resonator drive means and said resonator circuit means for amplifying said resonator signal voltage;



(d) current switch means coupled to said amplifier means and to said automatic gain control current for generating a station strength signal, said station strength signal having a current that is equal to a large fraction of said automatic gain control current when the frequency of said resonator signal voltage substantially equals said reference frequency;

(e) threshold ajustment and filter means coupled to said current switch means for filtering alternating current pulses from said station strength signal, for converting said station strength signal to a DC voltage, and for setting a threshold value; and

(f) threshold detector means coupled to said current switch means and said threshold adjustment and filter means for generating a stop signal when the voltage of said station strength signal exceeds said threshold value.

4,509,205

RADIO RECEIVER COMPRISING A FREQUENCY LOCKED LOOP WITH AUDIO FREQUENCY FEEDBACK, AND A MUTING CIRCUIT

Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

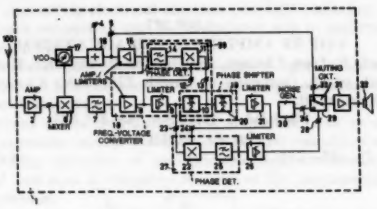
Continuation of Ser. No. 183,553, Sep. 2, 1980, Pat. No. 4,426,735. This application Aug. 10, 1983, Ser. No. 521,812

Claims priority, application Netherlands, Sep. 4, 1979, 7906602

Int. Cl.³ H04B *1/10, 1/26*

U.S. Cl. 455—194 **1 Claim**

1. A radio receiver having a frequency locked loop, said loop including a voltage controlled oscillator having an input for a tuning voltage, a mixer stage coupled to the voltage controlled oscillator and also connected to an antenna, a filter coupled to an output of the mixer stage, and a frequency-voltage converter coupled to an output of the filter, the receiver further having a muting circuit responsive to an audio signal output of said frequency-voltage converter and blocking the feeding of said audio signal to an audio signal processing section of the receiver unless the receiver is substantially correctly tuned to a broadcast transmission, said muting circuit receiving a correct tuning signal from a correct tuning detector coupled to said frequency-voltage converter, characterized in that the



frequency voltage converter is coupled to the voltage controlled oscillator via an amplifier-limiter.

4,509,206

RECEIVER FOR MULTICARRIER SIGNALS PROTECTED FROM UNWANTED SIGNALS

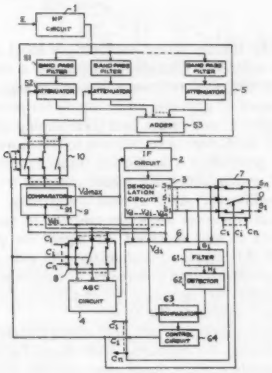
Michel Carpe; Claude Collin, and Marc Pontif, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 2, 1983, Ser. No. 490,513

Claims priority, application France, May 4, 1982, 82 07754

Int. Cl.³ H04B *1/26*

U.S. Cl. 455—245 **7 Claims**



1. A multicarrier signal receiver comprising a high frequency circuit for receiving a plurality of modulated carrier signals and having an output providing a corresponding plurality of modulated intermediate frequency carrier signals, a circuit for the preselection and selective attenuation of the intermediate frequency carrier signals comprising a plurality of filters tuned to the intermediate frequency carrier signals, whose inputs are connected to the output of the high frequency circuit and whose outputs are connected to respective attenuators, each having a control input and an output, an adder responsive to said attenuator outputs and having a sum output, an intermediate frequency amplification circuit having an input connected to the output of the adder, and an output, a demodulation circuit comprising a plurality of signal demodulation paths have one path for each modulated intermediate frequency carrier signal respective, each path including a filter connected to the output of the intermediate frequency amplification circuit, in series with a detector-amplifier and a demodulator, each path further including an elementary detection circuit for detecting an unwanted or interfering signal having an input connected to the output of a respective demodulator and an output supplying a control signal characteristic of an appearance or disappearance of an unwanted signal for the

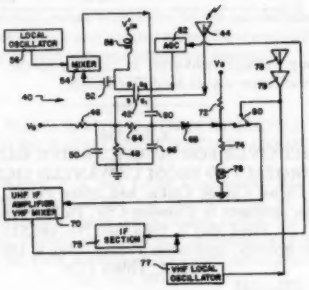
corresponding carrier signal, the output of the detection circuit associated with a particular carrier signal being coupled to the control input of the corresponding attenuator.

4,509,207

UHF RF AMPLIFIER AND AGC SYSTEM

Francis F. Tong, Chicago, and Harmon P. Vaughter, Evanston, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 7, 1983, Ser. No. 511,803
Int. Cl.³ H04B *1/26*
U.S. Cl. 455—251 **6 Claims**



1. In a UHF tuning system including a local oscillator for generating a reference frequency signal and a mixer coupled thereto for mixing said reference frequency signal with a received RF signal to generate an IF signal for processing in an IF stage coupled to said mixer, said UHF tuning system further including RF AGC means responsive to the amplitude of said IF signal for generating a correction signal for controlling the amplitude of said received RF signal coupled to the mixer, a UHF RF amplifier/IF AGC system comprising:

a field effect transistor amplifier coupled to said mixer and responsive to said received RF signal for providing an amplified RF signal to said mixer, the gain of said field effect transistor being controlled in response to said correction signal for regulating the amplitude of the amplified RF signal coupled to the mixer;

biasing means coupled to said field effect transistor amplifier for establishing the operating point thereof and for providing a variable control signal responsive to a variable condition at an output of said field effect transistor amplifier; and

a circuit coupled between said mixer and said IF stage and coupled to said biasing means and being responsive to said contral signal for regulating the amplitude of said IF signal coupled from said mixer to said IF stage.

4,509,208

FREQUENCY CONVERSION UNIT

Hiroyuki Sogo, Tokyo; Zenichi Ohsawa, Yokohama; Isamu Umino, Kawasaki, and Haruki Nishida, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 5, 1983, Ser. No. 482,300
Claims priority, application Japan, Apr. 6, 1982, 57-56092
Int. Cl.³ H04B *1/26*
U.S. Cl. 455—317 **12 Claims**

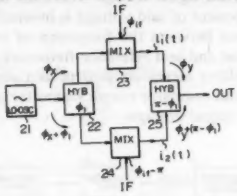
1. A frequency conversion unit receiving an intermediate frequency signal, comprising:

local oscillator means for supplying an oscillation output;

first mixer means, operatively connected to receive the intermediate frequency signal, for producing a first mixed frequency signal;

second mixer means, operatively connected to receive the intermediate frequency signal, for producing a second mixed frequency signal, the intermediate frequency signal in said second mixer means being π radians out of phase with the intermediate frequency signal in said first mixer means;

a first hybrid circuit, operatively connected to said local oscillator, said first mixer means and said second mixer means, for producing two outputs having a phase difference of a predetermined value ϕ_1 therebetween; and



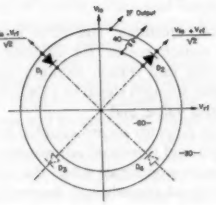
a second hybrid circuit, operatively connected to said first mixer means and said second mixer means, for producing a frequency conversion output signal, said second hybrid circuit phase-shifting the second mixed frequency signal by a predetermined value $(\pi-\phi_1)$ prior to mixing the first and second mixed frequency signals.

4,509,209

QUASI-OPTICAL POLARIZATION DUPLEXED BALANCED MIXER

Tatsuo Itoh, and Karl D. Stephan, both of Austin, Tex., assignors to Board of Regents, University of Texas System, Austin, Tex.

Filed Mar. 23, 1983, Ser. No. 477,968
Int. Cl.³ H04B *1/26*; H01Q *13/00*
U.S. Cl. 455—327 **4 Claims**



1. Apparatus for converting a free-space radio frequency signal into an intermediate frequency signal using a local oscillator signal, comprising:

a slot-ring antenna for receiving a quasi-optical free-space radio frequency signal and a local oscillator signal, the radio frequency signal being polarized in a direction orthogonal to the local oscillator signal; and

a pair of diodes connected to the slot ring antenna, for mixing the received radio frequency and local oscillator signals.

4,509,210

TELEVISION RECEIVER ADAPTABLE FOR DESCRAMBLER MODULE

Elliott S. Kohn, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 326,159
Int. Cl.³ H04B *1/08*; H04N *5/64, 5/44, 7/16*
U.S. Cl. 455—349 **6 Claims**

1. A television receiver adapted for use with a plurality of tunerless video signal descramblers, comprising:

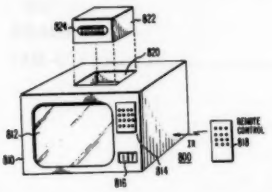
a cabinet for housing components of said receiver;

a tuner in said cabinet and having an input for receiving a

plurality of modulated television signals, said signals occupying both standard broadcast channels and cable television channels, said tuner being remotely controllable for selecting a predetermined one television signal from among said plurality and for converting said predetermined one television signal to an intermediate frequency signal, said tuner having an output terminal for providing said intermediate frequency signal thereat;

an intermediate-frequency signal amplifier in said cabinet for amplifying said intermediate-frequency signal, said amplifier having an input terminal and an output terminal;

a connector accessible from the exterior of said cabinet, said connector having first and second terminals;



first coupling means for coupling said output terminal of said tuner to said first terminal of said connector;

second coupling means for coupling said second terminal of said connector to said input terminal of said amplifier means; and wherein

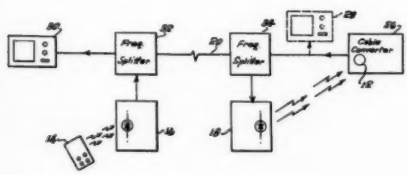
said connector is of a type selected to mate with a similar descrambler connector so that when the connectors are mated said intermediate frequency signal is coupled from said tuner to said amplifier via said connector thereby enabling descrambling of said intermediate frequency signal prior to amplification by said amplifier.

4,509,211

INFRARED EXTENSION SYSTEM

Michael S. Robbins, Los Angeles, Calif., assignor to Xantech Corporation, Sylmar, Calif.

Filed May 16, 1983, Ser. No. 494,807
Int. Cl.³ H04N 5/44
U.S. Cl. 455—603 **2 Claims**



1. In a television viewing system at one area of which there is a television receiver, and at a second area of which there is programmable apparatus for transmitting signals to said television receiver through a transmission line extending between said areas, said programmable apparatus having a light receiver ordinarily cooperable with a portable light transmitter for determining parameters of said apparatus, said portable light transmitter when in said first area, being beyond the range of said light receiver, the combination therewith of:

(a) a first transducer unit including a light emitter and located at said second area within the range of said receiver for converting electrical impulses into light radiation;

(b) means connecting said first transducer unit to said transmission line;

(c) a second transducer unit including a light sensor and located at said first area for converting light radiation into electrical signals;

(d) means connecting said second transducer unit to said transmission line for actuation of said first transducer unit whereby operation of said portable light transmitter at said one area is operative to control the programmable apparatus;

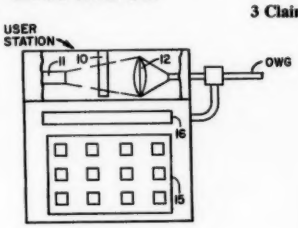
(e) and circuit means for isolating the intelligence of said transducers from said television receiver and from said programmable apparatus.

4,509,212

MULTIPLE-USER OPTICAL ANALYZER SYSTEM USING OPTICAL NETWORK FOR DATA TRANSMISSION AND CONTROL

Richard Baker, Medfield, Mass., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 10, 1983, Ser. No. 473,771
Int. Cl.³ H04B 9/00
U.S. Cl. 455—612 **3 Claims**



1. A multiple-user analyzer system comprising:

a centralized optical analyzer for receiving optical data signals from a remote sample input station and generating at least one electrical signal of an intensity proportional to the intensity of at least one selected frequency of the optical data signal;

multiple remote sample input stations for generating optical data signals containing color information about a sample inserted at the station by a system user, each station being connected to the analyzer by a low-loss optical fiber capable of transmitting optical data to the analyzer with low attenuation;

user terminal means connected to the optical fiber at each remote input station for generating or receiving optical communication or control signals transmitted over the optical fiber during system operation; and

analyzer controller means connected to the optical fiber and to the optical analyzer for controlling the operation of the analyzer during the receipt of optical data signals from a remote input station, and for generating or receiving optical communication or control signals carried over the fiber between the controller means and the user terminal means.

DESIGN PATENTS

GRANTED APR. 2, 1985

ERRATA

For CLASS	See PATENT NO.
D08–071	278,237

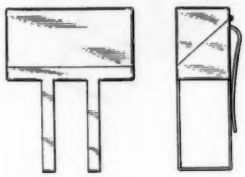
278,184
BOOT HEEL PROTECTIVE SHIELD
Lance D. Cross, Houston, Tex., assignor to Heel Shield, Inc., Houston, Tex.
Filed Sep. 17, 1982, Ser. No. 419,569
Term of patent 14 years
U.S. Cl. D2—277

278,185
SHOE UPPER
Martin Michaeli, Sarrebourg-Hoff, France, assignor to Chaussures Mephisto S.A., France
Filed Feb. 4, 1983, Ser. No. 463,931
Term of patent 14 years
U.S. Cl. D2—314

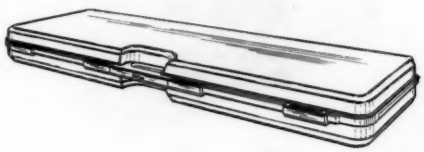
278,186
SHOE UPPER
Martin Michaeli, Sarrebourg-Hoff, France, assignor to Chaussures Mephisto S.A., France
Filed Feb. 4, 1983, Ser. No. 463,944
Term of patent 14 years
U.S. Cl. D2—314

278,187
PAINTER'S PROTECTIVE DEVICE
Lennart O. Rolin, Rullstensvägen 3, S-183 40 Täby, Sweden
Filed Feb. 12, 1982, Ser. No. 348,406
Claims priority, application Sweden, Aug. 14, 1981, 81-1742
Term of patent 14 years
U.S. Cl. D2—361

278,188
CIGARETTE PACK HOLDER
Michael D. Burns, 8255 Kingsbrook #240, Houston, Tex. 77024
Filed Sep. 2, 1982, Ser. No. 414,430
Term of patent 14 years
U.S. Cl. D2—400

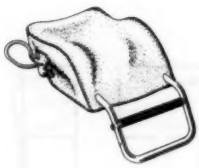


278,189
CASE FOR A GUN OR THE LIKE
Donald V. Frydenberg, Arlington, Tex., assignor to Doskocil Manufacturing Co., Inc., Arlington, Tex.
Filed Mar. 1, 1983, Ser. No. 470,967
Term of patent 14 years
U.S. Cl. D3—38



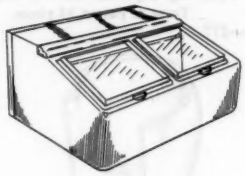
278,190
CARRYING BAG
Joe Ganz, 38-15 Garvey Pl., Fair Lawn, N.J. 07410
Filed Sep. 23, 1982, Ser. No. 422,159
Term of patent 14 years
U.S. Cl. D3—48

278,191
AUXILIARY SEAT FOR A CHILD
Michel Johansson, Götgatan 8B, S-573 00 Tranås, Sweden
Filed Jul. 19, 1982, Ser. No. 399,807
Claims priority, application Sweden, Feb. 2, 1982, 82-0217
Term of patent 14 years
U.S. Cl. D6—333

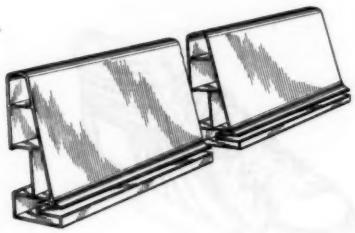


278,192
CHAIR
Anthony F. Albanese, Upper Montclair; Samuel Chaifin, Ho-Ho-Kus, and Lawrence M. Chaifin, Wayne, all of N.J., assignors to I.P.F. International, Inc., Paterson, N.J.
Filed Dec. 16, 1982, Ser. No. 450,232
Term of patent 14 years
U.S. Cl. D6—379

278,193
DISPLAY CASE
Stanley S. Boxall, Rte. 1, Box K4, Flowery Branch, Ga. 30542
Filed Aug. 9, 1982, Ser. No. 406,391
Term of patent 14 years
U.S. Cl. D6—471



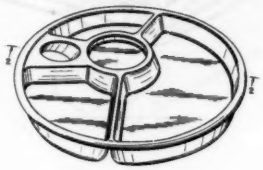
278,194
FURNITURE DRAWER WALL OR SIMILAR ARTICLE
Terence Hardy, Nether Heage, England, assignor to L. B. (Plastics) Limited, England
Filed May 24, 1982, Ser. No. 381,284
Claims priority, application United Kingdom, Nov. 26, 1981, 1003816
Term of patent 14 years
U.S. Cl. D6—510



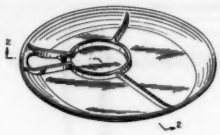
278,195
CHAIR
Cosmo N. Tisbo; Thomas A. Tisbo, both of Barrington; Ricard D. Recker, Palatine, and Bruce Heggeland, Rolling Meadows, all of Ill., assignors to Suncast Corporation, Batavia, Ill.
Filed Feb. 4, 1983, Ser. No. 463,717
Term of patent 14 years
U.S. Cl. D6—373

278,196
STORAGE RACK FOR COMPUTER EQUIPMENT
Thomas Koves, 431 Burnside Ave., Apt. 2C, Los Angeles, Calif. 90036
Filed Sep. 20, 1982, Ser. No. 423,040
Term of patent 14 years
U.S. Cl. D6—465

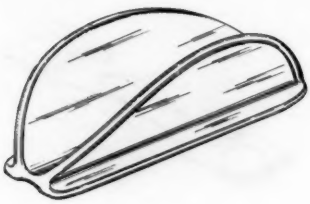
278,197
COMBINED PLATE AND GLASS HOLDER
James B. Harper, Warwick, England, assignor to Harford Overseas Limited, Irish Place,
Filed Dec. 15, 1982, Ser. No. 449,936
Claims priority, application United Kingdom, Aug. 12, 1982, 1008276
Term of patent 14 years
U.S. Cl. D7—27



278,198
COMBINED PLATE AND GLASS HOLDER
James B. Harper, Warwick, England, assignor to Harford Overseas Limited, Irish Place,
Filed Dec. 15, 1982, Ser. No. 450,157
Claims priority, application United Kingdom, Sep. 15, 1982, 1008734
Term of patent 14 years
U.S. Cl. D7—27



278,199
TACO HOLDER OR THE LIKE
Norman L. Richards, 219 Barcelona, San Clemente, Calif. 92672
Filed Sep. 30, 1982, Ser. No. 431,142
Term of patent 14 years
U.S. Cl. D7—76

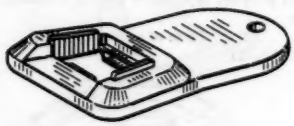


278,200
BEVERAGE CARBONATING MACHINE
Johan A. F. Dahlberg, Stockholm, Sweden, assignor to Kommanditbolaget Aldolf, Västerås, Sweden
Filed Nov. 2, 1982, Ser. No. 438,555
Claims priority, application Sweden, May 4, 1982, 82-1161
Term of patent 14 years
U.S. Cl. D7—312

278,201
INSTRUMENT FOR REMOVING KEY CAPS FROM A KEYBOARD
John A. Koepke, 8142 Sehome Rd., Blaine, Wash. 98230
Filed Jun. 7, 1982, Ser. No. 385,847
Term of patent 14 years
U.S. Cl. D8—17

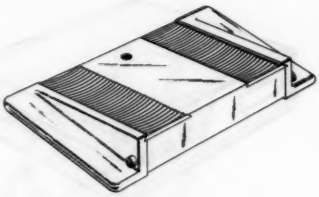
278,202
PAIL OPENER
Frank J. Romanowski, 24 Grove St., Easthampton, Mass. 01027
Filed Jul. 29, 1982, Ser. No. 403,148
Term of patent 14 years
U.S. Cl. D8—40

278,203
BOTTLE CAP OPENER
Heinz W. Braukmann, 98 Heathcote Ave., Willowdale, Ontario, Canada M2L 1Z4
Filed Apr. 21, 1983, Ser. No. 487,229
Claims priority, application Canada, Nov. 19, 1982, 51265
Term of patent 14 years
U.S. Cl. D8—40

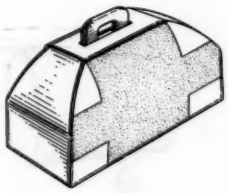


278,204
SUPPORT FOR PHONOGRAPH RECORDS DURING CLEANING OR THE LIKE
Manuel B. Guerra, Jr., 4100 Parkdale, Apt. 3301, San Antonio, Tex. 78229
Filed Sep. 7, 1982, Ser No. 415,699
Term of patent 14 years
U.S. Cl. D8—71

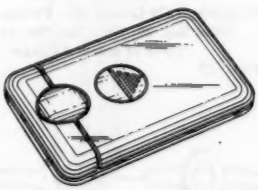
278,205
SKI SHARPENER
Erik Lindgren, Pl 1101, S-790 15 Sundborn, Sweden
Filed Apr. 19, 1982, Ser. No. 369,430
Claims priority, application Sweden, Oct. 21, 1981, 81-2384
Term of patent 14 years
U.S. Cl. D8—91



278,206
COMBINED SHIPPING, STORAGE AND PACKAGING CONTAINER
Laura M. Burdick, 330 4th Ave., Apt. B, Venice, Calif. 90291
Filed Sep. 30, 1982, Ser. No. 430,132
Term of patent 14 years
U.S. Cl. D9—327

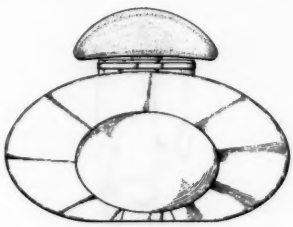


278,207
MEDICINE DISPENSER
John T. McLaughlin, 1839 Risa Pl., Glendale, Calif. 91208
Filed Nov. 15, 1982, Ser. No. 441,652
Term of patent 14 years
U.S. Cl. D9—339



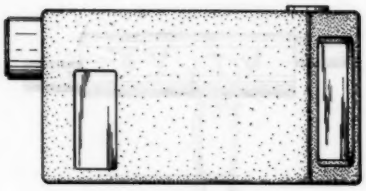
278,208
BOTTLE
Henry J. Cassai, 163-47 85 St., Howard Beach, N.Y. 11414, and Gino H. Cassai, 924 E. 96th St., Apt. 2, Brooklyn, N.Y. 11236
Filed May 17, 1982, Ser. No. 378,872
Term of patent 14 years
U.S. Cl. D9—352

278,209
BOTTLE
Pierre Dinand, Levallois, France, assignor to Helena Rubinstein, Inc., Secaucus, N.J.
Filed Oct. 29, 1982, Ser. No. 437,526
Term of patent 14 years
U.S. Cl. D9—384



278,210
COMPUTERIZED BICYCLE COMBINED SPEEDOMETER, ODOMETER AND STOP WATCH
Yoshimasa Tsuyama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Japan
Filed Jun. 2, 1982, Ser. No. 384,230
Term of patent 14 years
U.S. Cl. D10—46

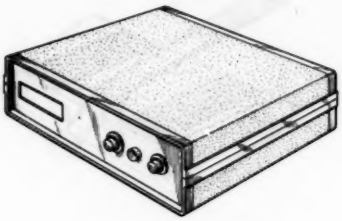
278,211
COATING THICKNESS GAGE
Frank Koch, R.F.D. #4, Ogdensburg, N.Y. 13669
Filed Sep. 13, 1982, Ser. No. 417,590
Term of patent 14 years
U.S. Cl. D10—46



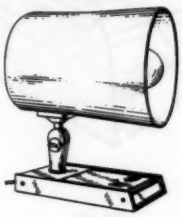
278,212
BATTERY TESTER
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Apr. 26, 1982, Ser. No. 371,763
The portion of the term of this patent subsequent to Aug. 16, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—77

278,213
WEIGHT RESPONSIVE SCALE
Walter P. Kushmuk, Niles, Ill., assignor to Continental Scale Corporation, Bridgeview, Ill.
Filed Feb. 26, 1982, Ser. No. 411,672
Term of patent 14 years
U.S. Cl. D10—92

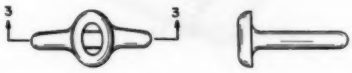
278,214
POSTAGE CONTROL AND COUNTER
Patrick J. Evans, Downers Grove, Ill., assignor to Evcor Systems, Inc., Downers Grove, Ill.
Filed Nov. 26, 1982, Ser. No. 444,809
Term of patent 14 years
U.S. Cl. D10—97



278,215
INTRUSION RADAR DEVICE
Robert E. Patterson, Lee's Summit, Mo., assignor to M. P. H. Industries, Inc., Chanute, Kans.
Filed Mar. 30, 1982, Ser. No. 363,654
Term of patent 14 years
U.S. Cl. D10—106



278,216
GEMLESS RING
Maxwell P. Lewis, 1229 Grouse Dr., Pittsburgh, Pa. 15243
Filed Sep. 29, 1982, Ser. No. 426,847
Term of patent 14 years
U.S. Cl. D11—27



278,217
WHEELCHAIR
Joe M. Nassiri, Thousand Oaks, Calif., assignor to Everest & Jennings, Inc., Camarillo, Calif.
Filed Dec. 10, 1982, Ser. No. 448,700
Term of patent 14 years
U.S. Cl. D12—131

278,218
VEHICLE TIRE
Kenichi Motomura, and Seiichiro Tokunaga, both of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Jan. 7, 1983, Ser. No. 456,457
Claims priority, application Japan, Jul. 29, 1982, 57-34007
Term of patent 14 years
U.S. Cl. D12—142

278,219
TIRE
Harold C. Gray, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Apr. 7, 1983, Ser. No. 483,022
Term of patent 14 years
U.S. Cl. D12—147

278,220
TIRE
Peter McDonald, Hudson, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Jun. 2, 1983, Ser. No. 500,500
Term of patent 14 years
U.S. Cl. D12—147

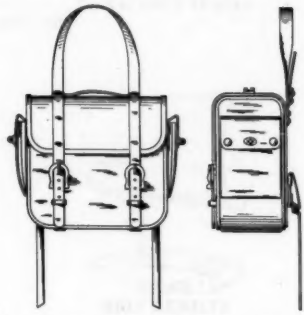
278,221
VEHICLE TIRE
Hiroshi Kojima, and Tooru Tsuda, both of Tokyo, Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan
Filed Jun. 27, 1983, Ser. No. 507,641
Claims priority, application Japan, Jan. 14, 1983, 58-751
Term of patent 14 years
U.S. Cl. D12—147

278,222
VEHICLE TIRE
Hiroshi Kojima, and Tosihiro Koyasu, both of Tokyo, Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan
Filed Sep. 8, 1983, Ser. No. 530,440
Claims priority, application Japan, Mar. 11, 1983, 58-9743
Term of patent 14 years
U.S. Cl. D12—147

278,223
VEHICLE TIRE
Hiroshi Kojima, and Yuji Sakamaki, both of Tokyo, Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan
Filed Sep. 8, 1983, Ser. No. 530,441
Claims priority, application Japan, Mar. 11, 1983, 58-9744
Term of patent 14 years
U.S. Cl. D12—147

278,224
VEHICLE TIRE
Masao Nakamura; Hiroshi Kojima, and Hideaki Nishio, all of Tokyo, Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan
Filed Jun. 27, 1983, Ser. No. 507,642
Term of patent 14 years
U.S. Cl. D12—151

278,225
MOTORCYCLE SADDLEBAG
John A. Heiman, Waukesha, and Richard D. Miller, Oconomowoc, both of Wis., assignors to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.
Filed Sep. 29, 1982, Ser. No. 428,409
Term of patent 14 years
U.S. Cl. D12—158



278,226
AIRPLANE
Charles Henderson, 8308 Cagle Rd., Fort Washington, Md. 20744
Filed Apr. 9, 1982, Ser. No. 367,218
Term of patent 14 years
U.S. Cl. D12—319

278,227

HELICOPTER

George W. Johnston, Jr., Arlington, Tex., assignor to Bell Helicopter Textron Inc., Providence, R.I.

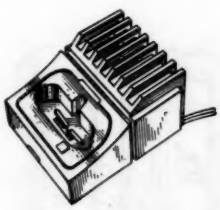
Filed Aug. 5, 1980, Ser. No. 175,574
Term of patent 14 years
U.S. Cl. D12—327

278,228

BATTERY CHARGER HOUSING FOR A PORTABLE BATTERY OPERATED TRANSCEIVER

James P. Liautaud, River and Bluff Rds., Trout Valley, Cary, Ill. 60013; Peter F. Stultz, Elgin, and David L. Maloney, Barrington, both of Ill., assignors to James P. Liautaud, Cary, Ill.

Filed Sep. 6, 1983, Ser. No. 529,959
Term of patent 14 years
U.S. Cl. D13—5

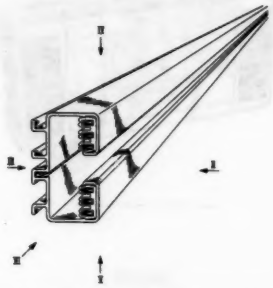


278,229

COLLECTOR RAIL

Jan Widell, Augustivägen 11; Harald Widell, Kalendervägen 25, and Nils-Ake Bergman, Junivägen 24, all of S-352 47 Växjö, Sweden

Filed Jun. 17, 1982, Ser. No. 389,662
Claims priority, application Sweden, Dec. 17, 1982, 81002976
Term of patent 14 years
U.S. Cl. D13—12

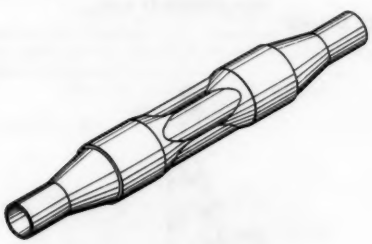


278,230

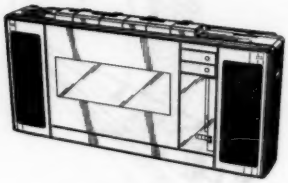
SPLICE CONNECTOR

Andrew A. Kominiak, Flanders, N.J., and Glenn J. Luzzi, Mount Bethel, Pa., assignors to Amerace Corporation, New York, N.Y.

Filed Oct. 18, 1982, Ser. No. 434,965
Term of patent 14 years
U.S. Cl. D13—24



278,231
COMBINED TAPE RECORDER AND RADIO RECEIVER
Michio Tanaka, Nara, and Masanori Hamada, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 16, 1982, Ser. No. 450,162
Claims priority, application Japan, Jun. 16, 1982, 57-27168
Term of patent 14 years
U.S. Cl. D14—5

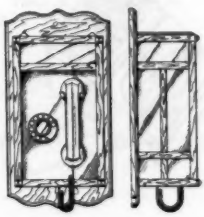


278,232
DISPLAY UNIT VIDEO TAPE PLAYER OR THE LIKE
Robert E. Gaskins, Mission Viejo, Calif., assignor to Eiki International, Inc., Laguna Niguel, Calif.
Filed Feb. 14, 1983, Ser. No. 465,962
Term of patent 14 years
U.S. Cl. D14—5

278,233
MICROPHONE MOUNTING STAND
Bruce N. Hardy, P.O. Box 4124, Elkhart, Ind. 46515
Filed Jan. 13, 1983, Ser. No. 457,723
Term of patent 14 years
U.S. Cl. D14—13

278,234
HEADPHONE
Tomonaga Saito, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Sep. 22, 1982, Ser. No. 421,329
Claims priority, application Japan, Apr. 1, 1982, 57-13967
Term of patent 14 years
U.S. Cl. D14—36

278,235
TELEPHONE
Lawrence M. Festa, 238 Cajon St., Laguna Beach, Calif. 92651
Filed Jan. 31, 1983, Ser. No. 462,472
Term of patent 14 years
U.S. Cl. D14—56

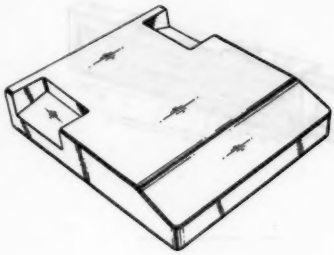


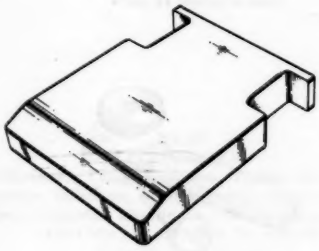
278,236

TELEPHONE SET BASE

Michael Brown, Nepean; Clifford D. Read, Almonte, and Warren K. Ellis, Constance Bay, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 15, 1983, Ser. No. 466,722
Term of patent 14 years
U.S. Cl. D14—60



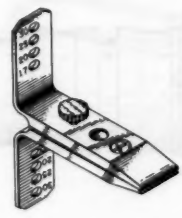


278,237

KNIFE HOLDER FOR KNIFE SHARPENER

Arthur L. LeVine, P.O. Box 800, Williamsville, N.Y. 14221

Filed Sep. 24, 1982, Ser. No. 423,478
Term of patent 14 years
U.S. Cl. D8—71

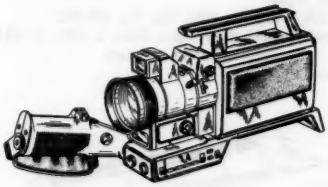


278,238

CAMERA FOR VIDEO TAPE RECORDER

Koya Kurokawa, and Noriyuki Arai, both of Ehime, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 28, 1982, Ser. No. 426,035
Claims priority, application Japan, Apr. 1, 1982, 57-13980
Term of patent 14 years
U.S. Cl. D14—78



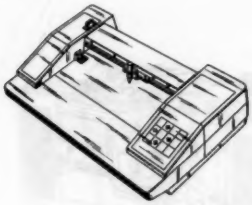
278,239

STAND-ALONE KEYBOARD

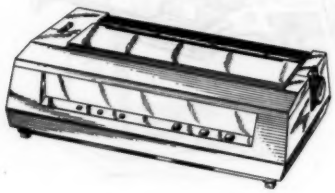
Christian Felix, Flushing, N.Y.; Donald M. Genaro, Haworth, N.J., and Casimer Gotfryd, Wauconda, Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Oct. 8, 1982, Ser. No. 433,593
Term of patent 14 years
U.S. Cl. D14—100

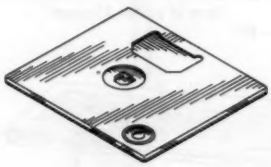
278,240
PLOTTER
Richard A. Murray, San Diego, Calif., assignor to Enter Computer, Inc., San Diego, Calif.
Filed Nov. 15, 1982, Ser. No. 441,722
Term of patent 14 years
U.S. Cl. D14—107



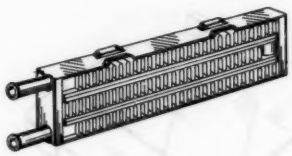
278,241
PRINTER FOR COMPUTER
Haruyuki Enomoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Aug. 24, 1982, Ser. No. 410,992
Claims priority, application Japan, Mar. 2, 1982, 57-8526
Term of patent 14 years
U.S. Cl. D14—111



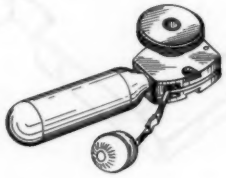
278,242
CASE CONTAINING A MAGNETIC DISC FOR RECORDING OF STILL PICTURES
Etsuro Saito, Ayase, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Feb. 10, 1982, Ser. No. 347,553
Claims priority, application Japan, Aug. 21, 1981, 56-36944
Term of patent 14 years
U.S. Cl. D14—114



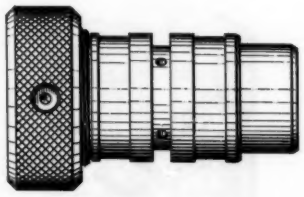
278,243
MOTORCYCLE OIL COOLER
Ytzhak Gewelber, 15510 Olive Branch Dr., La Mirada, Calif. 90638, assignor to Ytzhak Gewelber, La Mirada, Calif.
Filed Jun. 4, 1982, Ser. No. 384,890
Term of patent 14 years
U.S. Cl. D15—5



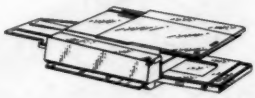
278,244
TIRE INFLATOR
Ronald L. Boetger, Willoughby, Ohio, assignor to Code Manufacturing, Inc., Willoughby, Ohio
Filed Aug. 27, 1982, Ser. No. 412,154
Term of patent 14 years
U.S. Cl. D15—7



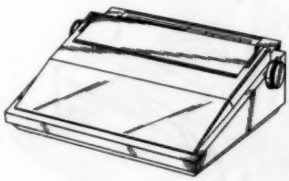
278,245
COLLET HOLDER
Roger R. Smith, Erin, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.
Filed Mar. 9, 1982, Ser. No. 356,414
Term of patent 14 years
U.S. Cl. D15—140



278,246
ELECTROPHOTOGRAPHIC COPIER
Nobuo Masaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 1, 1982, Ser. No. 437,950
Claims priority, application Japan, May 8, 1982, 57-19815
Term of patent 14 years
U.S. Cl. D16—31



278,247
TYPEWRITER
Ishin Miyamoto; Yasuo Nagamatsu; Toshiya Moriyama, and Masaharu Sakamoto, all of Fukuoka, Japan, assignors to Kyushu Matsushita Electric Co., Ltd., Fukuoka, Japan
Filed Mar. 24, 1983, Ser. No. 478,586
Term of patent 14 years
U.S. Cl. D18—1



278,248
TYPEWRITER
Toshiaki Funato; Masayuki Morishita, and Masafumi Itoh, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jul. 6, 1983, Ser. No. 511,342
Claims priority, application Japan, Jan. 11, 1983, 58-501
Term of patent 14 years
U.S. Cl. D18—1

278,249

REMOTE CONTROL DESK FOR MULTICOLOR PRINTING MACHINE

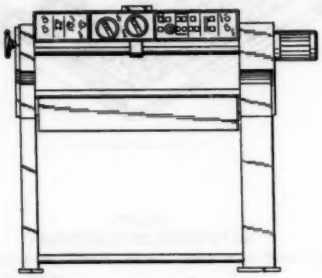
Alfred Schott; Hans Johne, both of Radebeul; Karl-Heinz Förster, Dresden; Helmut Schuck, Coswig, and Horst Schulz, Dresden, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

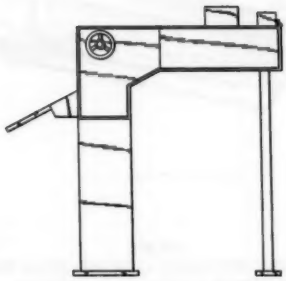
Filed Feb. 1, 1982, Ser. No. 344,780

Claims priority, application German Democratic Rep., Apr. 21, 1981, 14012-U2212

Term of patent 14 years

U.S. Cl. D18—22





278,250

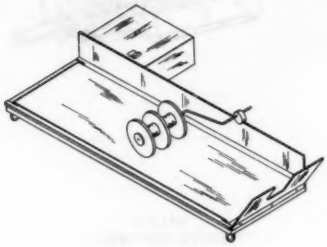
ENVELOPE POWER CONVEYOR STACKER

Burton J. Rosensweig, San Mateo; George H. Bingham, and Edward A. Krupotich, both of Los Altos, all of Calif., assignors to Omation Corporation, Mountain View, Calif.

Filed Jul. 12, 1982, Ser. No. 397,133

Term of patent 14 years

U.S. Cl. D18—22



278,251

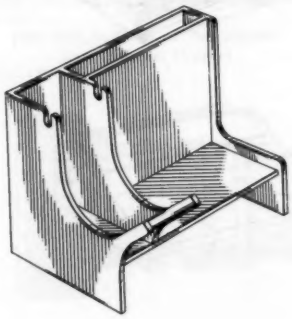
TAPE DISPENSER

Nathan F. Dobbs, 361 Collins St., Ormond Beach, Fla. 32074

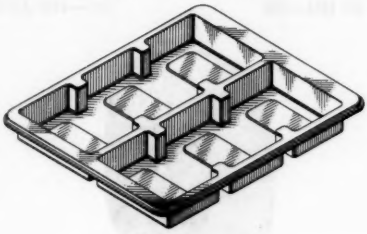
Filed Nov. 5, 1982, Ser. No. 439,344

Term of patent 14 years

U.S. Cl. D19—69

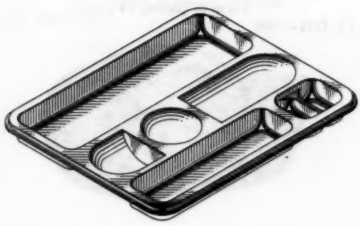


278,252
DRAWER INSERT FOR A DESK STORAGE TRAY SYSTEM
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Nov. 22, 1982, Ser. No. 443,181
Term of patent 14 years
U.S. Cl. D19—75

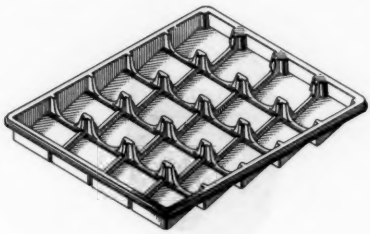


278,253
DRAWER INSERT FOR A DESK STORAGE TRAY SYSTEM
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Nov. 22, 1982, Ser. No. 443,187
Term of patent 14 years
U.S. Cl. D19—75

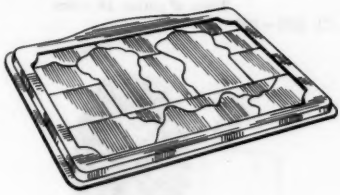
278,254
DRAWER INSERT FOR A DESK STORAGE TRAY SYSTEM
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Nov. 22, 1982, Ser. No. 443,211
Term of patent 14 years
U.S. Cl. D19—75



278,255
DRAWER INSERT FOR A DESK STORAGE TRAY SYSTEM
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Dec. 13, 1982, Ser. No. 449,243
Term of patent 14 years
U.S. Cl. D19—75



278,256
COMBINED PUZZLE AND TRAY
Pamela J. Lockhart, Sterling Heights, Mich., assignor to CPG Products Corp., Minneapolis, Minn.
Filed Jul. 12, 1982, Ser. No. 397,642
Term of patent 14 years
U.S. Cl. D21—104



278,257
TOY ANIMAL STALL
Americo D'Ambra, Jr., Johnston, and Kenneth Nichols, Providence, both of R.I., assignors to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Mar. 21, 1983, Ser. No. 477,417
Term of patent 14 years
U.S. Cl. D21—114

278,258
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 12, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,325
Term of patent 14 years
U.S. Cl. D21—190

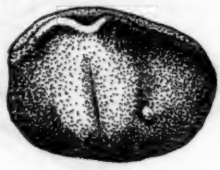
278,259
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 12, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,326
Term of patent 14 years
U.S. Cl. D21—190

278,260
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,329
Term of patent 14 years
U.S. Cl. D21—190

278,261
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,438
Term of patent 14 years
U.S. Cl. D21—190

278,262
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 278,262
Term of patent 14 years
U.S. Cl. D21—190

278,263
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,440
Term of patent 14 years
U.S. Cl. D21—190



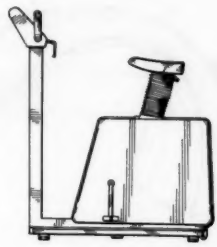
278,264
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,642
Term of patent 14 years
U.S. Cl. D21—190

278,265
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,644
Term of patent 14 years
U.S. Cl. D21—190

278,266
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,645
Term of patent 14 years
U.S. Cl. D21—190

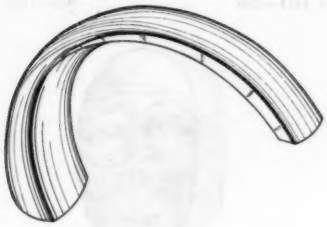
278,267
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Sep. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,647
Term of patent 14 years
U.S. Cl. D21—190

278,268
EXERCISE AND FITNESS TESTING MACHINE
Heikki Kiiski, Turku, Finland, assignor to Tunturipyora Oy, Turku, Finland
Filed Nov. 30, 1982, Ser. No. 445,520
Claims priority, application Finland, Jun. 3, 1982, 498/82
Term of patent 14 years
U.S. Cl. D21—194

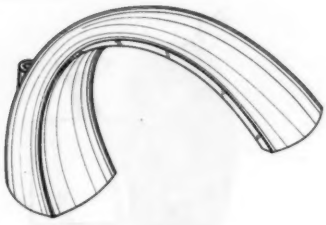


278,269
PASSENGER SEAT FOR AN AMUSEMENT RIDE
Michael J. Thornalley, Lincoln, England, assignor to Fibrecast (UK) Limited, Lincoln, England
Filed Aug. 19, 1982, Ser. No. 409,725
Claims priority, application United Kingdom, Feb. 22, 1982, 821005246
Term of patent 14 years
U.S. Cl. D21—247

278,270
BATH SPOUT OR SIMILAR ARTICLE
James E. Niemann, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.
Filed Mar. 7, 1983, Ser. No. 472,798
Term of patent 14 years
U.S. Cl. D23—32

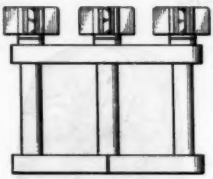


278,271
LAVATORY SPOUT OR SIMILAR ARTICLE
James E. Niemann, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.
Filed Mar. 7, 1983, Ser. No. 472,799
Term of patent 14 years
U.S. Cl. D23—32

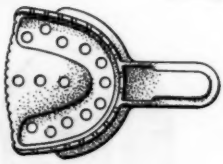


278,272
OILSTOVE
Nobuyuki Kojima, and Youichi Sekigawa, both of Kamo, Japan, assignors to Toshiba Heating Appliances Co., Ltd., Japan
Filed Aug. 3, 1982, Ser. No. 404,839
Claims priority, application Japan, Feb. 18, 1982, 57-6639
Term of patent 14 years
U.S. Cl. D23—122

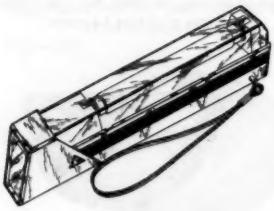
278,273
PRESS FOR HOLDING A PAIR OF RELINED DENTURES FOR CURING
John W. Mitchell, Sr., 1701 W. 168th St., Gardena, Calif. 90247
Filed Jun. 2, 1982, Ser. No. 384,183
Term of patent 14 years
U.S. Cl. D24—4



278,274
DENTAL IMPRESSION MAXILLARY TRAY
Hyman S. Levine, 74 Fifth Ave., New York, N.Y. 10011
Filed Mar. 17, 1982, Ser. No. 359,102
Term of patent 14 years
U.S. Cl. D24—10



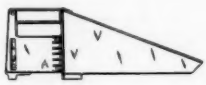
278,275
LANTERN
Kittson Mann, Kowloon, Hong Kong, assignor to Chung Mei Metal and Plastic Factory, Kowloon, Hong Kong
Filed Dec. 27, 1982, Ser. No. 453,335
Term of patent 14 years
U.S. Cl. D26—42

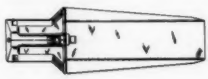


278,276
COSMETIC CASE
Dieter Bakic, Roemerstrasse 15, D-8000 Muenchen 40, Fed. Rep. of Germany
Filed Sep. 8, 1982, Ser. No. 416,094
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 12 924
Term of patent 14 years
U.S. Cl. D28—78

278,277
RIDING SADDLE
Judith A. Sarnelli, 15521 Morrison St., Sherman Oaks, Calif. 91403
Filed Jun. 16, 1982, Ser. No. 388,799
Term of patent 14 years
U.S. Cl. D30—20

278,278
PORTABLE VACUUM CLEANER
Don R. McCloskey, Trappe, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Jan. 28, 1983, Ser. No. 462,103
Term of patent 14 years
U.S. Cl. D32—18





LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF APRIL, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Taylor, Chandler R., Jr.; and Stauffer, Harold F., Jr., 4,508,724, Cl. 514-317.000.

A. J. Sparks & Company: *See*—
Catrambone, Joel, 4,508,223, Cl. 206-423.000.

A-Lok Products Corporation: *See*—
Ditcher, John, 4,508,355, Cl. 277-189.000.

AAR Corp.: *See*—
Hitt, Gerard J.; Nowakowski, Victor A.; and Warren, Walter R., 4,507,962, Cl. 73-384.000.

Aavid Engineering, Inc.: *See*—
McCarthy, Alfred F., 4,508,163, Cl. 165-80.00B.

Abe, Kazunori: *See*—
Kamada, Kazumasa; Tamai, Katsumi; Shimomura, Yasunori; and Abe, Kazunori, 4,509,163, Cl. 369-284.000.

Abe, Toshiro: *See*—
Hama, Hiroaki; and Abe, Toshiro, 4,507,938, Cl. 62-324.100.

Abex Corporation: *See*—
Nolden, Wilhelm, 4,508,011, Cl. 91-506.000.

Abramson, Daniel. Surgical drain. 4,508,533, Cl. 604-35.000.

Achard, Georges, to Rhovyl. Yarns and fibers good properties, based on atactic polyvinyl chloride, and process for the production. 4,508,778, Cl. 428-364.000.

Acker, Rolf-Dieter; Parg, Adolf; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Silylalkyl thioalkanoates and their use for controlling undesirable plant growth. 4,508,915, Cl. 556-418.000.

Ackerman, Charles B., to Motorola, Inc. Melt level sensing system and method. 4,508,970, Cl. 250-577.000.

Ackland, Bryan D.; Burr, David J.; and Weste, Neil H. E., to AT&T Bell Laboratories. Time warp signal recognition processor using recirculating and/or reduced array of processor cells. 4,509,187, Cl. 381-43.000.

Ackmann, Paul W.; and Bryant, Frank R., to Mostek Corporation. Recessed metallization. 4,508,815, Cl. 430-314.000.

Acushnet Company: *See*—
Brown, Robert A., 4,508,309, Cl. 249-81.000.

Adair, Paul C., to Mead Corporation. Photosensitive material employing encapsulated radiation sensitive composition and a transparentizable image-receiving layer. 4,508,807, Cl. 430-138.000.

Adams, James R., Jr.: *See*—
Wilwerding, Dennis J.; and Adams, James R., Jr., 4,508,963, Cl. 250-201.000.

Adams, Karen M.; and Gandhi, Haren S., to Ford Motor Company. Method for treating exhaust gases with an improved catalyst composition. 4,508,691, Cl. 423-213.500.

Adiletta, Joseph G., to Pall Corporation. Gas permeable composite structures. 4,508,775, Cl. 428-240.000.

Adir: *See*—
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,508,729, Cl. 514-419.000.

Adolf Illig Maschinenbau GmbH & Co.: *See*—
Janke, Jurgen, 4,508,670, Cl. 264-40.600.

Adolphi, Heinrich: *See*—
Lange, Arno; Kiehs, Karl; and Adolphi, Heinrich, 4,508,734, Cl. 514-594.000.

AEG-Kanis Turbinenfabrik GmbH: *See*—
Teckentrup, Hermann; and Hoffmann, Wilhelm, 4,507,926, Cl. 60-656.000.

Agapiou, Agapios K., to Exxon Research & Engineering Co. Supported polyolefin catalyst for the polymerization of ethylene under high temperatures. 4,508,844, Cl. 502-132.000.

Agency of Industrial Science & Technology: *See*—
Jido, Morio, 4,508,265, Cl. 239-3.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Boie, Immo; Luhrig, Hermann; and Kovacic, Guido, 4,508,809, Cl. 430-237.000.

Agfa-Gevaret Aktiengesellschaft: *See*—
Weber, Klaus; Hujer, Friedrich; and Schaner, Ferdinand, 4,508,224, Cl. 206-455.000.

Agin, Patricia P.: *See*—
Pawelek, John M.; and Agin, Patricia P., 4,508,706, Cl. 424-60.000.

Agnew, Palmer W.; Coviello, John S.; Green, Linda S.; and Kellerman, Anne S., to International Business Machines Corporation. Method for controlling the file transfer capability of an interactive text processing system that is emulating a host processing system terminal. 4,509,122, Cl. 364-200.000.

Air Products and Chemicals, Inc.: *See*—
Pierantozzi, Ronald, 4,508,846, Cl. 502-174.000.

Aisan Industry Co., Ltd.: *See*—
Tamura, Yoshio; Ito, Takaaki; and Morino, Toshiharu, 4,508,664, Cl. 261-44.00C.

Aizawa, Hitomi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece with record/playback circuits. 4,508,457, Cl. 368-63.000.

Aizawa, Shoji: *See*—
Saito, Eiiji; Aizawa, Shoji; Mitsui, Michio; Miyata, Tomohiko; and Kuroda, Masayuki, 4,508,266, Cl. 239-3.000.

Ajax Consolidated Co.: *See*—
Bretz, Frank E., 4,507,937, Cl. 62-298.000.

Ajinomoto Company, Incorporated: *See*—
Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,508,912, Cl. 549-253.000.

AKG Akustische u.Kino-gerate gesellschaft mbH: *See*—
Fidi, Werner; Pribyl, Richard; and Wolf, Konrad, 4,508,192, Cl. 181-158.000.

Akima, Isao: *See*—
Tanimura, Nobuyoshi; Yamamoto, Sho; Yoshizaki, Kazuo; and Akima, Isao, 4,509,147, Cl. 365-190.000.

Akiyama, Nobuyuki: *See*—
Hara, Yasuhiko; Akiyama, Nobuyuki; Fushimi, Satoru; Oshima, Yoshimasa; and Aoki, Nobuhiko, 4,508,453, Cl. 356-394.000.

Aktiebolaget Hassle: *See*—
Junggren, Ulf K.; and Sjostrand, Sven E., 4,508,905, Cl. 546-271.000.

Al-Ansari, Jasem M.: *See*—
Schaetzle, Walter J.; Brett, C. Everett; and Al-Ansari, Jasem M., 4,507,925, Cl. 60-641.400.

Albany International Corp.: *See*—
Bikson, Benjamin; Coplan, Myron J.; and Gotz, Gertrud, 4,508,852, Cl. 521-27.000.

Albright, Roger N.: *See*—
Hubler, Lawrence C.; Ferrara, Joseph J.; Albright, Roger N.; and Bassett, Raymond C., 4,508,329, Cl. 270-53.000.

Alexandrovich, George; Edinger, J. Raymond; Hofer, Alan; and Kuykendall, John, to Pickering & Company, Inc. Aluminum-aluminum oxide stylus arm. 4,509,159, Cl. 369-170.000.

Alfa-Laval AB: *See*—
Jakobson, Sten; and Rabold, Karl, 4,508,058, Cl. 119-14.020.

Allegheny Valve Company: *See*—
DeFrees, Joseph H., deceased, 4,508,131, Cl. 137-43.000.

Allen, Dillis V. Speed loader. 4,507,889, Cl. 42-89.000.

Allen, Henry E.: *See*—
Banko, William, 4,507,976, Cl. 73-861.540.

Allen, Richard S.: *See*—
Mims, Donald S.; and Allen, Richard S., 4,508,172, Cl. 166-303.000.

Allgood, Robert N.; Peterson, Joe W.; and Whatley, Roger A., to Motorola, Inc. MOS Analog switch driven by complementary, minimally skewed clock signals. 4,508,983, Cl. 307-577.000.

Allied Corporation: *See*—
Bailey, William R., 4,508,413, Cl. 339-129.000.
Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., 4,508,257, Cl. 228-263.130.
Brush, Robert W., Sr.; and Werth, Dee A., 4,508,406, Cl. 339-89.00M.
Canham, Kevin, 4,508,410, Cl. 339-99.00R.
Evans, Rowland M., 4,507,915, Cl. 60-39.281.
Fairbairn, Leroy W.; and Waldron, Clifford R., 4,507,858, Cl. 29-747.000.
Kaniuk, John A.; Meinking, William E.; and Morris, Jeffrey R., 4,508,835, Cl. 501-94.000.
Salatiello, Peter P.; Petrucelli, Frank; and Flood, Paul W., 4,508,675, Cl. 264-310.000.
Shepler, Eric F.; and Knapp, Anthony W., 4,508,408, Cl. 339-89.00M.
Vanderkooi, Nicholas, Jr.; Stevenson, Philip E.; and Welgos, Robert J., 4,508,769, Cl. 428-36.000.

Alpegiani, Marco; Battistini, Carlo; Bedeschi, Angelo; Franceschi, Giovanni; Foglio, Maurizio; and Zarini, Franco, to Farmitalia Carlo Erba. Process for preparing optically active penems. 4,508,649, Cl. 260-245.20R.

Alper, Yekutiel: *See*—
Wolf, Isaac; and Alper, Yekutiel, 4,507,911, Cl. 56-327.00R.

Althoff, Erwin: *See*—
Langhoff, Joseph; Althoff, Erwin; Kolodzey, Wolfgang; and Gerhardus, Ulrich, 4,508,542, Cl. 48-77.000.

Aluminum Company of America: *See*—
Bush, J. Finley; and Gaydoski, Gary F., 4,508,689, Cl. 423-127.000.

Amada Company, Limited: *See*—
Ikeda, Hidekatsu, 4,507,997, Cl. 83-368.000.

Amana Refrigeration, Inc.: *See*—
Carlson, Roger W., 4,508,948, Cl. 219-10.55M.

Amateau, Maurice F.; and Karasek, Keith R., to International Harvester Company. Graphite-metal matrix bearings and methods of manufacturing. 4,508,158, Cl. 164-110.000.

Amato, Joseph S.; Weinstock, Leonard M.; and Karady, Sandor, to Merck & Co., Inc. Process for preparation of alpha-alkyl amino acids. 4,508,921, Cl. 562-443.000.

Ambrose, Richard J.: *See*—
Hergenrother, William L.; Matlock, Mark G.; and Ambrose, Richard J., 4,508,874, Cl. 525-285.000.

AMCA International Corporation: *See*—
Olig, Eugene A.; and Ladwig, Lee R., 4,509,126, Cl. 364-474.000.

American Bell, Inc.: *See*—
Bantel, Richard G.; and Herr, Diane E., 4,509,167, Cl. 370-62.000.

American Cyanamid Company: *See*—
Coy, David H.; and Murphy, William A., 4,508,711, Cl. 514-11.000.

American Filtrona Corporation: *See*—
Berger, Richard M., 4,508,525, Cl. 493-43.000.

American Hospital Supply Corporation: *See*—
Matier, William L.; Erhardt, Paul W.; and Patil, Ghanshyam, 4,508,725, Cl. 514-362.000.
Wyatt, Philip W.; Newsome, Allen L., Jr.; Bloom, William G.; Siegel, Bernard; and Lubov, Michael, 4,508,123, Cl. 128-692.000.

Amoroso, Salvatore, Jr.; and Conklin, Russell W., to United Technologies Corporation. Automatic adaptive sensitivity time control for a ground mapping radar. 4,509,050, Cl. 343-5.0SM.

AMP Incorporated: *See*—
Bunnell, Edward D., 4,508,415, Cl. 339-143.00R.
Casciotti, Albert; McCleerey, Earl W.; and Cosmos, Pete, 4,508,401, Cl. 339-14.00R.
Cherry, Hitesh; and Werner, Walter M., 4,508,409, Cl. 339-97.00R.
Dowling, Edward C.; and Fortuna, Jon A., 4,508,399, Cl. 339-17.0CF.
Hughes, Richard L.; and Sigmon, Ned A., 4,508,411, Cl. 339-99.00R.

Ampex Corp.: *See*—
Kudelski, Stefan, 4,508,292, Cl. 242-190.000.

Amphlett, Godfrey W.; and Hrinda, Michael E., to Armour Pharmaceutical Company. Process for purifying factor VIII:C. 4,508,709, Cl. 424-101.000.

Anbe, Yoshiharu: *See*—
Koyama, Toshihiro; Anbe, Yoshiharu; and Funahashi, Takuo, 4,507,946, Cl. 72-17.000.

Anders, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Extruder. 4,508,454, Cl. 366-80.000.

Anders, Edward O., to Dailey Petroleum Services Corp. Method and apparatus for controlling azimuthal drift of a drill bit. 4,508,182, Cl. 175-61.000.

Anderson, Bernard O., to Nielsen Industries, Inc. Milking barn. 4,508,059, Cl. 119-14.030.

Anderson, Daryl E.: *See*—
Brown, Robert L.; Jones, William A.; and Anderson, Daryl E., 4,508,586, Cl. 156-401.000.

Anderson, George B., to Sea World, Inc. Marine acoustic analysis system and method. 4,509,151, Cl. 367-118.000.

Anderson, John M., to General Electric Company. Fluorescent lamp without ballast. 4,508,993, Cl. 315-59.000.

Anderson, Max F. Wind generating means. 4,507,916, Cl. 60-641.100.

Anderson, Richard N., to V. E. Anderson Mfg. Co. Window structure. 4,507,894, Cl. 49-449.000.

Andrade, Joseph D.; Triolo, Philip M.; Smith, Lee M.; and Miller, Frank J. Process for treating polymer surfaces to reduce their friction resistance characteristics when in contact with non-polar liquid, and resulting products. 4,508,606, Cl. 204-169.000.

Andre, Eugene R. Pressure chuck for irregular articles. 4,508,326, Cl. 269-22.000.

Andren, Carl F.; Mosley, William H., Jr.; and Sanders, David E., to E-Systems, Inc. Method and apparatus for pulse angle modulation. 4,509,017, Cl. 329-105.000.

Andrews, Robert S. L. Apparatus for reclaiming foundry sand. 4,508,277, Cl. 241-65.000.

Anetsberger Brothers, Inc.: *See*—
Anetsberger, Richard J.; and Anetsberger, John A., 4,508,026, Cl. 99-407.000.

Anetsberger, John A.: *See*—
Anetsberger, Richard J.; and Anetsberger, John A., 4,508,026, Cl. 99-407.000.

Anetsberger, Richard J.; and Anetsberger, John A., to Anetsberger Brothers, Inc. Basket moving mechanism for deep fat fryer. 4,508,026, Cl. 99-407.000.

Angres Clinic, Ltd.: *See*—
Angres, Giora G., 4,508,106, Cl. 128-1.00R.

Angres, Giora G., to Angres Clinic, Ltd. Microsurgical method for applying permanent eyelid liner. 4,508,106, Cl. 128-1.00R.

Anic, S.p.A.: *See*—
Romano, Ugo; and Iori, Giuseppe, 4,508,656, Cl. 260-463.000.

AOs Metall & Mek. Verkstad AB: *See*—
Gajecki, Rickard, 4,508,995, Cl. 315-209.00R.

Aoki, Nobuhiko: *See*—
Hara, Yasuhiko; Akiyama, Nobuyuki; Fushimi, Satoru; Oshima, Yoshimasa; and Aoki, Nobuhiko, 4,508,453, Cl. 356-394.000.

Aoyagi, Kouji: *See*—
Hayashi, Yoshio; Aoyagi, Kouji; Sakurai, Toshio; Kashima, Tusnehiro; and Higeta, Koichi, 4,509,138, Cl. 364-900.000.

Apace Research Limited: *See*—
Reeves, Russell R., 4,508,873, Cl. 525-91.000.

Arai, Tetsuji, to Ushio Denki Kabushiki Kaisha. Light-radiant furnace. 4,508,960, Cl. 219-388.000.

Arakawa Kagaku Kogyo Kabushiki Kaisha: *See*—
Oseto, Osamu; and Moriuchi, Fumio, 4,508,806, Cl. 430-109.000.

Arango, Aurelio, to Arango, Miguel Angel. Device for extracting paste from a tube. 4,508,240, Cl. 222-96.000.

Arango, Miguel Angel: *See*—
Arango, Aurelio, 4,508,240, Cl. 222-96.000.

ARBED S.A.: *See*—
Fleming, Georges, 4,508,323, Cl. 266-191.000.

Arc Technologies Systems Ltd.: *See*—
Lades, Hans; Fink, Friedrich; Liebel, Siegfried; Lauterbach, Inge; Taube, Thomas; and Zollner, Dieter, 4,509,178, Cl. 373-93.000.

Arco Industries Ltd.: *See*—
D'Andrade, Bruce M.; and Sing Chuen, Johnny Y., 4,508,516, Cl. 446-443.000.

Arconthorn Limited: *See*—
Moreuil, Rene , 4,508,733, Cl. 514-578.000.

Arcu Armaturindustri AB: *See*—
Hammarstedt, Gosta, 4,507,921, Cl. 60-527.000.

Argintaru, Lazare: *See*—
Luginbuhl, Pierre; Parniere, Alain; and Argintaru, Lazare, 4,509,200, Cl. 455-12.000.

Argus Chemical Corporation: *See*—
Kauder, Otto S.; and Keeley, Charles, 4,508,863, Cl. 524-181.000.

Arias, Beairit C.: *See*—
Larrauri, Jose M.; Arias, Beairit C.; and Galiasso, Roberto E., 4,508,616, Cl. 208-111.000.

Arimatsu, Seiji: *See*—
Sakurai, Kiyomi; and Arimatsu, Seiji, 4,508,814, Cl. 430-303.000.

Aritomi, Mitsutoshi: *See*—
Hokamura, Sadakazu; Shinohara, Toshio; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,508,767, Cl. 427-407.100.

Arlt, Dieter, to Bayer Aktiengesellschaft. Dialkoxymethyl-butyrolactones. 4,508,913, Cl. 549-320.000.

Armour Pharmaceutical Company: *See*—
Amphlett, Godfrey W.; and Hrinda, Michael E., 4,508,709, Cl. 424-101.000.

Armstrong International, Inc.: *See*—
Schlesch, Ronald D.; and Lyons, Robert F., 4,508,135, Cl. 137-185.000.

Arnoldt, Peter J., to Ductmate Industries, Inc. Flange type duct joint assembly and seal arrangement therefor. 4,508,376, Cl. 285-363.000.

Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH: *See*—
Bachmann, Erich; Fabel, Ludwig; Fischer, Roland; Peter, Werner; Scheiter, Bernd; and Wenzel, Werner, 4,508,494, Cl. 418-13.000.

Arvey Corporation: *See*—
Sak, Dennis A.; Mestetsky, Thomas; and Manne, Stanley, 4,509,196, Cl. 383-5.000.

Asahi Glass Company Ltd.: *See*—
Ukihashi, Hiroshi; Asawa, Tatsuro; Yamabe, Masaaki; and Miyake, Haruhisa, 4,508,603, Cl. 204-98.000.
Yoshida, Shohei; and Vogl, Otto, 4,508,882, Cl. 526-259.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Kuriki, Tomio; and Manabe, Seiichi, 4,508,674, Cl. 264-234.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Ogawa, Ryota, 4,508,434, Cl. 350-454.000.

Asano, Masamichi; and Iwahashi, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,509,148, Cl. 365-230.000.

Asao, Yasuzi; and Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Support for electrographic plate-making material and a lithographic printing plate employing same. 4,508,804, Cl. 430-62.000.

Asawa, Tatsuro: *See*—
Ukihashi, Hiroshi; Asawa, Tatsuro; Yamabe, Masaaki; and Miyake, Haruhisa, 4,508,603, Cl. 204-98.000.

ASE (UK) Limited: *See*—
Temple, John D., 4,508,363, Cl. 280-808.000.

ASEA Aktiebolag: *See*—
Svedberg, Per, 4,509,089, Cl. 361-100.000.

Ashikaga, Tadashi: *See*—
Ohnishi, Kouhei; Ashikaga, Tadashi; and Terashima, Masayuki, 4,509,003, Cl. 318-800.000.

Ashizawa, Masaaki: *See*—
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,508,777, Cl. 428-280.000.

Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,508,653, Cl. 260-410.500.
Zandona, Oliver J.; Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., 4,508,839, Cl. 502-65.000.

Ashton, Richard D. A., to North American Decorative Products Inc. Reversible angle display. 4,508,230, Cl. 211-181.000.

Asia Oil Company, Limited: *See*—
Onuma, Kazuhiko; Kageyama, Yoichi; Kobayashi, Hiromu; Matsuki, Akihiro; and Suzuki, Makoto, 4,508,841, Cl. 502-73.000.

Asulab S.A.: *See*—
Dinger, Rudolf, 4,507,970, Cl. 73-702.000.
Monbaron, Jean-Jacques; and Bui, Ngoc C., 4,509,133, Cl. 364-513.500.

AT&T Bell Laboratories: *See*—
Ackland, Bryan D.; Burr, David J.; and Weste, Neil H. E., 4,509,187, Cl. 381-43.000.
Bantel, Richard G.; and Herr, Diane E., 4,509,167, Cl. 370-62.000.
Banu, Mihai; and Tsividis, Yannis, 4,509,019, Cl. 330-107.000.
Bosch, Martin A.; and Lemons, Ross A., 4,509,145, Cl. 365-112.000.
DasGupta, Sujan; and Purvis, Merton B., 4,509,098, Cl. 361-398.000.

AT&T Information Systems Inc.: *See*—
Burger, William A.; Embree, David M.; Singer, Martin H.; and Vogelpohl, David R., 4,508,937, Cl. 179-84.00T.

AT&T Technologies, Inc.: *See*—
Lorimer, D'Arcy H.; and Handy, Christopher C., Jr., 4,508,688, Cl. 423-92.000.
Wong, Ching-Ping, 4,508,758, Cl. 427-96.000.
Atkinson, Gerald O., to Hughes Tool Company. Clamping assembly. 4,507,843, Cl. 29-466.000.
Atlantic Richfield Company: *See*—
Taylor, Paul D.; and Mocella, Michael T., 4,508,923, Cl. 568-311.000.
Younes, Usama E., 4,508,883, Cl. 526-262.000.
Aubry, Claude; Chaumette, Jacques; and Touchon, Pierre, to Saint-Gobain Vitrage. Method for the differentiated hardening of glass sheets, especially of automobile windshields, and tempered glass sheet. 4,508,783, Cl. 428-410.000.
Auer, C. J.: *See*—
Lack, Larry H., 4,507,990, Cl. 81-57.390.
Auer, Frank M.: *See*—
Lack, Larry H., 4,507,990, Cl. 81-57.390.
Augat Inc.: *See*—
Damon, Neil F.; and Rydwansky, Frank C., Jr., 4,508,405, Cl. 339-75.0MP.
Augustus, Jimmie R.: *See*—
Lawson, Robert; Augustus, Jimmie R.; Corless, Robert; and Kardash, John, 4,508,939, Cl. 179-90.00B.
Aulagner, Michel; and Jour, Jean-Paul. Double cable funicular transport device, looped on itself and with speed variation. 4,508,205, Cl. 198-334.000.
Autoclave Engineers, Inc.: *See*—
Zimmerman, Franz X., 4,509,179, Cl. 373-109.000.
Autoflug GmbH: *See*—
Singer, Klaus-Peter; and Butenop, Klaus, 4,508,289, Cl. 242-107.40B.
Avakian, Roger W., to General Electric Company. Thermally stabilized polyetherimides. 4,508,861, Cl. 524-101.000.
Avella, Frank S.: *See*—
Johnson, Sigurd A.; Avella, Frank S.; and Jones, Robert I., 4,508,305, Cl. 208-455.000.
AVX Corporation: *See*—
Prymak, John D., 4,509,103, Cl. 361-321.000.
Axthammer, Ludwig; and Wossner, Felix, to Fichtel & Sachs AG. Piston rod with an integral piston for a shock absorber. 4,508,201, Cl. 188-322.190.
Ayer, John B., to Canadian Patents & Dev. Limited. Voltage controlled current switch with short circuit protection. 4,509,102, Cl. 361-92.000.
Ayukawa, Taizo, to Kakudai Shosan Kabushiki Kaisha; and Taizo Ayukawa. Hair tonic composition. 4,508,707, Cl. 424-70.000.
B.A.T. Cigaretten-Fabriken GmbH: *See*—
Hirsch, Werner; and Ehling, Uwe, 4,507,875, Cl. 34-44.000.
Babcock & Wilcox Company, The: *See*—
Kaya, Azmi; and Sommer, Alan C., 4,507,930, Cl. 62-129.000.
Keyes, Marion A.; and Thompson, William L., 4,509,041, Cl. 340-578.000.
Bachmann, Erich; Fabel, Ludwig; Fischer, Roland; Peter, Werner; Scheiter, Bernd; and Wenzel, Werner, to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH. Two stage rotary vane pump. 4,508,494, Cl. 418-13.000.
Baduel, Guy M., to Isover Saint-Gobain. Method and apparatus for scrubbing effluent gases from mineral fiber production. 4,508,555, Cl. 65-3.430.
Baggiolini, Enrico G.; Batcho, Andrew D.; Boris, Alfred; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Synthesis of 1α,25-dihydroxyergocalciferol. 4,508,651, Cl. 260-397.200.
Bailey, Derrick S.; Cogswell, Frederic N.; and Griffin, Brian P., to Imperial Chemical Industries, PLC. Shaped articles formed from polymers capable of exhibiting anisotropic melts. 4,508,891, Cl. 528-191.000.
Bailey, Donald L.: *See*—
Packo, Joseph J.; and Bailey, Donald L., 4,508,631, Cl. 252-68.000.
Bailey, Frank C.: *See*—
Law, Kock-Yee; and Bailey, Frank C., 4,508,803, Cl. 430-59.000.
Bailey, Wayne E. Two reservoir solar air-weight impelling hydro power system. 4,508,971, Cl. 290-1.00R.
Bailey, William R., to Allied Corporation. Connector. 4,508,413, Cl. 339-129.000.
Baird, Donald H.: *See*—
Freeman, Eva C.; and Baird, Donald H., 4,508,610, Cl. 204-192.00P.
Baker Oil Tools, Inc.: *See*—
Weinberg, Roger A.; and Glaser, Mark C., 4,508,167, Cl. 166-120.000.
Baker, Richard, to Corning Glass Works. Multiple-user optical analyzer system using optical network for data transmission and control. 4,509,212, Cl. 455-612.000.
Baker, Rodney W. Ratchet tool. 4,507,989, Cl. 81-57.390.
Baker, Terence S.; and Couslon, William F. Assay. 4,508,830, Cl. 436-510.000.
Bakhshi, Shiv K.: *See*—
Stahl, Steven B.; Bakhshi, Shiv K.; and Naul, George M., 4,508,673, Cl. 264-120.000.
Balbinot, Renzo: *See*—
Vaccari, Franco; and Balbinot, Renzo, 4,507,877, Cl. 36-2.600.
Baldwin, Graham J.; and McCann, Michael O., to Smiths Industries Public Limited Company. Chip-carrier substrates. 4,509,096, Cl. 361-386.000.
Ball Corporation: *See*—
Frawley, Norman E., 4,508,404, Cl. 339-45.00M.
Lester, James M.; Reinker, Richard P.; and Regenbrecht, Douglas E., 4,507,941, Cl. 62-514.00R.
Ball, David J., to International Telephone & Telegraph Corporation. Self-locking connector. 4,508,407, Cl. 339-89.00R.
Balser, Klaus, to Bayer Aktiengesellschaft. Process for the production of hydroxyalkyl methyl celluloses. 4,508,895, Cl. 536-91.000.
Bamberg, Joe T.; and Kohn, Gustave K., to Zoecon Corporation. 3-Amino-4-(2-pyridyloxy)phenoxyalkanoic and alkenoic acid esters. 4,508,906, Cl. 546-300.000.
Banko, William, to Shamos, Morris; and Allen, Henry E. Flow meter with hall effect sensor and method. 4,507,976, Cl. 73-861.540.
Banks, Julia G.; and Ficho, William, to Vasilia Ltd. Personalized items and process for making them. 4,508,156, Cl. 164-35.000.
Banks, R. L. Olefin metathesis catalyst. 4,508,850, Cl. 502-351.000.
Bantel, Richard G.; and Herr, Diane E., to AT&T Bell Laboratories; and American Bell, Inc. Data conference arrangement. 4,509,167, Cl. 370-62.000.
Banu, Mihai; and Tsividis, Yannis, to AT&T Bell Laboratories. Tunable active filter. 4,509,019, Cl. 330-107.000.
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Hofmann, Karl; and Banzhaf, Werner, 4,508,275, Cl. 239-533.300.
Baran, Paul; and Pranger, Maarten R., to Packet Technologies, Inc. Two-way cable-television system. 4,509,073, Cl. 358-86.000.
Barbagli, Rino O., to Fiatallis Europe, S.p.A. Remote controlled hydraulic circuit having selector means for establishing priority therein. 4,508,013, Cl. 91-516.000.
Barclay, John A., to United States of America, Energy. Low-temperature magnetic refrigerator. 4,507,927, Cl. 62-3.000.
Baron, Walter J., to Water Services of America, Inc. Dash pot basket for heat exchanger tube cleaning element. 4,508,164, Cl. 165-95.000.
Barr, Rodney E.; and Kochanek, George E., to Borg-Warner Corporation. Housing for capacitive pressure sensor. 4,507,973, Cl. 73-724.000.
Barrow, Billy E.; Barrow, William E.; and Barrow, Michael A., to Barrow Systems, Inc. Bottling plant cooling systems. 4,507,931, Cl. 62-175.000.
Barrow, Michael A.: *See*—
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Barsotti, Rudolf H.; and Grove, Arthur W., to International Business Machines Corporation. Differential sensor measuring apparatus and method including sensor compensator circuitry. 4,509,007, Cl. 324-60.00C.
Barth, Tomislav: *See*—
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Bartholdson, Lennart O., to Polar-Plastik HB. Implantable breast prostheses. 4,507,810, Cl. 3-36.000.
Bartholomew, Donald D., to Proprietary Technology, Inc. Manually releasable drainport closure apparatus. 4,508,234, Cl. 215-206.000.
Bartlett, Keith G.; and Caolo, Mary A., to Hewlett-Packard Company. Polymethyl methacrylate compatible silicon dioxide complexing agent. 4,508,591, Cl. 156-659.100.
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Acker, Rolf-Dieter; Parg, Adolf; and Wuerzer, Bruno, 4,508,915, Cl. 556-418.000.
Grabhoefer, Herbert; and Volkert, Otto, 4,508,774, Cl. 428-220.000.
Lange, Arno; Kiehs, Karl; and Adolphi, Heinrich, 4,508,734, Cl. 514-594.000.
Mueller, Josef; Wiersdorff, Walter-Wielant; Kirschenlohr, Werner; and Schwantje, Gerd, 4,508,924, Cl. 568-322.000.
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Bast, Wilhelm, to Faust-Fertigungstechnik GmbH & Co. KG. Apparatus for applying viscous substances particularly adhesives. 4,508,051, Cl. 118-410.000.
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Fink, Hans, 4,508,582, Cl. 156-93.000.
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Baumberger, Otto; and Kalbskopf, Reinhard, 4,508,054, Cl. 118-718.000.
Carter, Timothy J. N.; and Dahne, Claus, 4,508,832, Cl. 436-517.000.
Battery Engineering Inc.: *See*—
Epstein, James; and Marincic, Nikola, 4,507,857, Cl. 29-623.200.
Battistini, Carlo: *See*—
Alpegiani, Marco; Battistini, Carlo; Bedeschi, Angelo; Franceschi, Giovanni; Foglio, Maurizio; and Zarini, Franco, 4,508,649, Cl. 260-245.20R.
Battles, James E.: *See*—
Knoedler, Reinhard; Nelson, Paul A.; Shimotake, Hiroshi; and Battles, James E., 4,508,797, Cl. 429-184.000.

Bauer, Gerhard; Hees, Eckart; and Beckers, Karl-Dieter, to Thyssen Aktiengesellschaft vorm. August Thyssen-Hutte; and Martin & Pagenstecher GmbH. Slidable closure element for slide closures of metallurgical vessels. 4,508,241, Cl. 222-600.000.

Bauer, Gordon L., to Wyrepak Industries, Inc. Cap assembly with friction drag on tension brus'. 4,508,290, Cl. 242-128.000.

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Michel, Christian G.; Schachter, Rozalie; Kuck, Mark A.; Baumann, John A.; and Raccah, Paul M., 4,508,931, Cl. 136-255.000.

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Baumgartner, Hans; and Sudbeck, Rainer, to Pierburg GmbH & Co. KG. Method of regulating the charge of combustion gas delivered to an internal combustion engine. 4,508,089, Cl. 123-559.000.

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Calamai, Edward G.; and Daigle, Martha A., 4,508,643, Cl. 260-112.00B.
Garver, Edward B., Sr.; and Zabielski, Kenneth D., 4,508,534, Cl. 604-111.000.
Keilman, Michael R.; and West, Richard, 4,508,236, Cl. 215-308.000.

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Arlt, Dieter, 4,508,913, Cl. 549-320.000.
Balser, Klaus, 4,508,895, Cl. 536-91.000.
Reinehr, Ulrich; Herbertz, Toni; and Jungverdorben, Hermann-Josef, 4,508,672, Cl. 264-78.000.
Schmidt, Adolf, 4,508,862, Cl. 524-157.000.
Schmidt, Manfred; Bottenbruch, Ludwig; and Freitag, Dieter, 4,508,890, Cl. 528-167.000.
Sirinyan, Kirkor; and Merten, Rudolf, 4,508,780, Cl. 428-407.000.
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Bayha, Renee: *See*—
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Bean, Maura M.; Nishita, Kazuko D.; and Hoops, Elizabeth A., to United States of America, Agriculture. Method for preparing improved quality rice-containing baked products. 4,508,736, Cl. 426-19.000.

Beavers, John A.; and North, Willard F., to Hughes Tool Company. Method of reclaiming electric motor laminations. 4,508,583, Cl. 156-94.000.

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Zandona, Oliver J.; Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., 4,508,839, Cl. 502-65.000.

Becker, Billy G.; and Swafford, Charles V., to BST Lift Systems, Inc. Subsurface safety system. 4,508,166, Cl. 166-117.500.

Becker, James R. Toy building. 4,508,519, Cl. 446-478.000.

Becker, Wolfram; and Denz, Helmut, to Robert Bosch GmbH. Electronically controlled fuel metering system for an internal combustion engine. 4,508,082, Cl. 123-478.000.

Beckerer, Frank S., Jr. Holder for containers. 4,508,303, Cl. 248-311.200.

Beckers, Karl-Dieter: *See*—
Bauer, Gerhard; Hees, Eckart; and Beckers, Karl-Dieter, 4,508,241, Cl. 222-600.000.

Becton Dickinson and Company: *See*—
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Bed Store, The: *See*—
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Bedekovic, Davor; and Fletcher, Ian J., to Ciba Geigy Corporation. Preparation of chromogenic azaphthalides. 4,508,897, Cl. 544-127.000.

Bedeschi, Angelo: *See*—
Alpegiani, Marco; Battistini, Carlo; Bedeschi, Angelo; Franceschi, Giovanni; Foglio, Maurizio; and Zarini, Franco, 4,508,649, Cl. 260-245.20R.

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Beerwald, Hans; Boehm, Guenter; and Glomski, Guenter, to Schott Glaswerke. Plasma process for the production of a dielectric rod. 4,508,554, Cl. 65-3.100.

Behn, Reinhard; Heywang, Hermann; and Pachonik, Horst, to Siemens Aktiengesellschaft. Method and a device for the production of electrical components, in particular laminated capacitors. 4,508,049, Cl. 118-50.100.

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Heber, Helmut; Eberle, Reinhard; and Teetz, Volker, 4,508,644, Cl. 260-112.50R.
Toth, Tibor, 4,508,831, Cl. 436-512.000.

Beisswanger, Rudolf, to J. M. Voith GmbH. Winding machine for winding a web slit lengthwise. 4,508,283, Cl. 242-56.400.

Bekesi, Julius G.: *See*—
DeBarbieri, Augusto; and Bekesi, Julius G., 4,508,710, Cl. 514-19.000.

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Stepan, William E.; Neese, Wayne E.; Belanger, Thomas D., Jr.; and Janninck, Robert F., 4,508,398, Cl. 339-17.0LM.

Belart, Juan, to ITT Industries, Inc. Hydraulic brake booster. 4,508,008, Cl. 91-372.000.

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Burger, William A.; Embree, David M.; Singer, Martin H.; and Vogelpohl, David R., 4,508,937, Cl. 179-84.00T.
Daudelin, Douglas S., 4,509,120, Cl. 364-200.000.

Belliveau, Dennis A.; and Thomas, Eugene W., to Hitchiner Manufacturing Co., Inc. Self-tapping support for shell molds. 4,508,157, Cl. 164-63.000.

Belonger, Donald P.: *See*—
Gilbert, Wilbur E.; Martin, Robert E.; and Belonger, Donald P., 4,508,387, Cl. 297-429.000.

Ben Clements & Sons, Inc.: *See*—
Furutsu, Akira, 4,507,828, Cl. 24-16.0PB.

Bench, Ronald W.; and Hineline, Edson S., Jr., to Comdial Telephone Systems, Inc. Push-button dial for a telephone. 4,508,938, Cl. 179-90.0BD.

Bencsik, Peter: *See*—
Fogassy, Elemer; Toke, Laszlo ; Faigl, Ferenc; Soos, Rudolf; Bozzay, Jozsef; Kolta, Rezso; Nemes, Jozsef; and Bencsik, Peter, 4,508,919, Cl. 562-401.000.

Bennett, Terry A.; Claassen, George R.; and Zimmerman, William B., to PPG Industries, Inc. Method and apparatus for bending glass sheets to complicated shapes including an S-shaped transverse bend. 4,508,556, Cl. 65-25.400.

Benson, Werner: *See*—
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,508,716, Cl. 514-220.000.

Bente, Lynn A.: *See*—
Wideman, Lawson G.; and Bente, Lynn A., 4,508,930, Cl. 585-377.000.

Beppu, Kohichi; and Kawakami, Shigezo, to Kabushiki Kaisha Kobe Seiko Sho. Pressure reduction apparatus for solid particle-containing high pressure liquids. 4,508,549, Cl. 55-165.000.

Beran, Debra L.; Cann, Kevin J.; Jorgensen, Robert J.; Karol, Frederick J.; Maraschin, Norma J.; and Marcinkowsky, Arthur E., to Union Carbide Corporation. Ethylene polymerization using supported vanadium catalyst. 4,508,842, Cl. 502-112.000.

Berardi, Randal L., to RCA Corporation. Apparatus for accurately establishing the sealing length of CRT envelopes. 4,507,873, Cl. 33-180.00R.

Berenz, John J.: *See*—
McIver, George W.; Nakano, Kenichi; and Berenz, John J., 4,507,845, Cl. 29-571.000.

Beres, Arthur W.; and Verderico, Joseph P., to Goodyear Tire & Rubber Company, The. Cable take-up for tire vulcanizer. 4,508,497, Cl. 425-28.00R.

Berfield, Robert C.; Crevling, Robert L., Jr.; and Lawson, Lonnie B., Jr., to Shop-Vac Corporation. Air flow responsive outlet from tank of vacuum cleaner. 4,508,550, Cl. 55-216.000.

Berg, Keith E. Self cleaning indoor barbecue griller. 4,508,097, Cl. 126-41.00R.

Berger, Christian; Farge, Daniel; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, to Rhone-Poulenc Sante. Cephalosporin derivatives, their preparation and compositions containing them. 4,508,717, Cl. 514-203.000.

Berger, Richard M., to American Filtrona Corporation. Method and apparatus for producing tobacco smoke filter having improved tar/carbon monoxide ratio. 4,508,525, Cl. 493-43.000.

Bergmann, Roland: *See*—
Strempel, Hans-Jurgen; Diehl, Manfred; and Bergmann, Roland, 4,508,633, Cl. 252-135.000.

Bergstrom, John R., to Mo och Domsjo Aktiebolag. Process for recovery of sulfur dioxide liberated in the chemical pulping of lignocellulosic material. 4,508,593, Cl. 162-29.000.

Bernard, Jean: *See*—
Beyl, Jean; Bernard, Jean; Guerreau, Rene ; le Faou, Daniel; and Peyre, Henri, 4,508,360, Cl. 280-605.000.

Bernard, Walter J.; and Millard, Richard J., to Sprague Electric Company. Reducing the oxygen content of tantalum. 4,508,563, Cl. 75-0.5BB.

Bernett, Thomas B., to Eaton Corporation. Flow control device. 4,508,144, Cl. 138-45.000.

Berry, Paul S.; Kettlewell, Peter J.; and Turner, Michael J. B., to National Research Development Corporation. Poultry-harvesting assembly. 4,508,062, Cl. 119-82.000.

Bertin & Cie: *See*—
Schlegel, Raymond F.; Bourassin, Rene P.; and Lapeutre, Michel A., 4,508,530, Cl. 494-49.000.

Bertini, Millo. Target-pigeon launcher. 4,508,093, Cl. 124-1.000.

Bessac, Michel, to Foncages et Forages Bessac, S.A. Machine for making underground galleries. 4,508,390, Cl. 299-33.000.

Betts, Edmund D.; and Keith, Jon T., to Gregor Jonsson Associates, Inc. Self-adjusting tail breaker means. 4,507,825, Cl. 17-73.000.

Betts, William L.: *See*—
Bremer, Gordon; and Betts, William L., 4,509,171, Cl. 370-100.000.

Beyl, Jean; Bernard, Jean; Guerreau, Rene ; le Faou, Daniel; and Peyre, Henri, to Ste LOOK. Ski brake. 4,508,360, Cl. 280-605.000.

Bhise, Vijay S.; and Gilman, Harold, to Halcon SD Group, Inc., The. Preparation of glycols from ethylene oxide. 4,508,927, Cl. 568-858.000.

Bianchi, Nereo, to NECCHI Societa per Azioni. Needle clamp for a sewing machine. 4,508,042, Cl. 112-226.000.

Biegel, Robert A., to Thrall Car Manufacturing Company. Handbrake system for railway car. 4,508,197, Cl. 188-47.000.

Bienwald, F. Wolfgang, to Leviton Manufacturing Company, Inc. Plug-in wire terminal system. 4,508,417, Cl. 339-176.00L.

Bikson, Benjamin; Coplan, Myron J.; and Gotz, Gertrud, to Albany International Corp. Compositions and method of preparation by chlorosulfonation of difficultly sulfonatable poly(ether sulfone). 4,508,852, Cl. 521-27.000.

Bingham, F. Emmett: *See*—
Fenton, Donald M.; Delaney, Dennis D.; and Bingham, F. Emmett, 4,508,537, Cl. 23-293.00S.

Bingmann, Horst, to Hoechst Aktiengesellschaft. Fluorane compounds. 4,508,904, Cl. 546-196.000.

Bio-Response, Inc.: *See*—
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Bion Corporation: *See*—
Roberts, Michael K.; Ottosen, Richard A.; and McConnell, Matthew L., 4,507,968, Cl. 73-626.000.

Biotest-Serum-Institut GmbH: *See*—
Sonneborn, Hans H.; Schwulera, Udo; and Schleussner, Hans, 4,508,833, Cl. 436-543.000.

Bittner, Franz; Poortman, Boudewijn J.; Rademacher-Dubbick, Kristian; Roskam, Abram K.; Stevens, Udo; and Tromp, Wouter T., to Rheometron AG. Measured-value sensors for magnetic-inductive flowmeters. 4,507,975, Cl. 73-861.120.

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Mulders, Gerardus L. M.; and Hermans, Jacobus G. J. M., 4,508,471, Cl. 405-109.000.

Biziere, Kathleen: *See*—
Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille G., 4,508,720, Cl. 514-247.000.

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Eriksson, Sune; Santen, Sven; and Bjorling, Gotthard, 4,508,566, Cl. 75-88.000.

Blackwell, Kim J.; White, Russell T., Jr.; and Wilson, James W., to International Business Machines Corporation. Shield for improved magnetron sputter deposition into surface recesses. 4,508,612, Cl. 204-298.000.

Blanc, Maurice: *See*—
Green, David; and Blanc, Maurice, 4,508,743, Cl. 426-422.000.

Blank, Gerald. Hot water control and management system. 4,508,261, Cl. 236-20.00R.

Blechman, Abraham: *See*—
Smiley, Harry; and Blechman, Abraham, 4,508,505, Cl. 433-18.000.

Bloechel, Bradley A. Collapsible portable stove and carrying case therefor. 4,508,095, Cl. 126-9.00R.

Bloom, William G.: *See*—
Wyatt, Philip W.; Newsome, Allen L., Jr.; Bloom, William G.; Siegel, Bernard; and Lubov, Michael, 4,508,123, Cl. 128-692.000.

Blumberg, Ben, Jr.: *See*—
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Blumenkranz, James J., to R & G Sloane Mfg. Co., Inc. Plastic pipe joint. 4,508,368, Cl. 285-21.000.

Board of Regents, University of Texas System: *See*—
Itoh, Tatsuo; and Stephan, Karl D., 4,509,209, Cl. 455-327.000.

Bock, Rudolf. Hydraulic motor. 4,508,010, Cl. 91-474.000.

Bodden, Werner; and Diegelmann, Winfried, to Schunk & Ebe GmbH. Method of making surface-hardened sinter-iron part. 4,508,681, Cl. 419-29.000.

Bodenseewerk Geratetechnik GmbH: *See*—
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Bohlen, Heinz; and Demmel, Enzio, to U.S. Philips Corporation. Microwave amplifier tube having two ring resonators. 4,508,992, Cl. 315-5.390.

Boie, Immo; Luhrig, Hermann; and Kovacic, Guido, to Agfa-Gevaert Aktiengesellschaft. Process for the exposure and development of photo-graphic images and an apparatus for carrying out the process. 4,508,809, Cl. 430-237.000.

Boissel, Pierre; and Tong, Mathias, to Cameca. Electronic optical apparatus comprising pyrolytic graphite elements. 4,508,967, Cl. 250-396.00R.

Bolgert, Edwin F., to Kohler Co. Wall mountable vacuum breaker. 4,508,137, Cl. 137-218.000.

Boliden Aktiebolag: *See*—
Leirnes, Johan S.; Lundstrom, Malkolm S.; Hedlund, Martin L.; and Buren, Kurt J. A., 4,508,565, Cl. 75-77.000.

Bolle, Fred; Herronen, John R.; and Wright, Joseph M., to Tek-Matik, Inc. Adjustable torque conveyor roller drive. 4,508,212, Cl. 198-781.000.

Bolza-Schunemann, Claus A., to Koenig & Bauer Aktiengesellschaft. Control mechanism to disable driven ink metering elements in rotary printing machines. 4,508,034, Cl. 101-365.000.

Booker, James D., Jr. Cooking apparatus for vertically suspending and rotating meat. 4,508,028, Cl. 99-421.00V.

Booth, Dwight E., to Warner Electric Brake & Clutch Company. Methods and apparatus for controlling the engagement of gap-type electromagnetic couplings. 4,509,091, Cl. 361-154.000.

Booth, Nicholas H.; Hatch, Roger C.; and Crawford, Lester M., to University of Georgia Research Foundation, Inc. Antagonism of central nervous system drugs by the administration of 4-aminopyridine alone or in combination with other drugs. 4,508,715, Cl. 514-280.000.

Borchardt, John K., to Halliburton Company. Method of viscosifying aqueous fluids and process for recovery of hydrocarbons from subterranean formations. 4,508,629, Cl. 252-8.55D.

Bordat, Andre J. E., to Constructions Mecaniques de Normandie. Connections between dividing walls, particularly for the construction of boat hulls. 4,508,047, Cl. 114-355.000.

Borg-Warner Corporation: *See*—
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Boris, Alfred: *See*—
Baggiolini, Enrico G.; Batcho, Andrew D.; Boris, Alfred; and Uskokovic, Milan R., 4,508,651, Cl. 260-397.200.

Borner, Willy; and Jackson, Bernie F. Slow speed dynamic wheel balancer. 4,507,964, Cl. 73-462.000.

Boros, John, to Rockwell International Corporation. Flexible circuit board interconnect having low thermal conductivity. 4,509,095, Cl. 361-386.000.

Bosch, Martin A.; and Lemons, Ross A., to AT&T Bell Laboratories. Electrically biased optical storage medium. 4,509,145, Cl. 365-112.000.

Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., to Allied Corporation. Method of brazing with nickel based alloy. 4,508,257, Cl. 228-263.130.

Bottenbruch, Ludwig: *See*—
Schmidt, Manfred; Bottenbruch, Ludwig; and Freitag, Dieter, 4,508,890, Cl. 528-167.000.

Bottka, Nicholas: *See*—
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Bourassin, Rene P.: *See*—
Schlegel, Raymond F.; Bourassin, Rene P.; and Lapautre, Michel A., 4,508,530, Cl. 494-49.000.

Boutwell, Johnie R., to Tubing Testors, Inc. Wraparound used for testing tubing with premixed gases. 4,507,954, Cl. 73-40.700.

Bowden, William L.: *See*—
Gopikanth, Mysore L.; Kuo, Han C.; and Bowden, William L., 4,508,798, Cl. 429-196.000.

Bowen, James B.; and Kramer, Charles F., to Steel Heddle Mfg. Co. Heddle frame and composite frame slat construction. 4,508,145, Cl. 139-92.000.

Bowles Fluidics Corporation: *See*—
Stouffer, Ronald D., 4,508,267, Cl. 239-11.000.

Bowman, James A., to Hoover Universal, Inc. Seat track assembly. 4,508,385, Cl. 297-341.000.

Bowman, James L., to Ingersoll-Rand Co. Rotary, positive-displacement machine, of the helical-rotor type, and rotors therefor. 4,508,496, Cl. 418-201.000.

Bozzay, Jozsef: *See*—
Fogassy, Elemer; Toke, Laszlo ; Faigl, Ferenc; Soos, Rudolf; Bozzay, Jozsef; Kolta, Rezso; Nemes, Jozsef; and Bencsik, Peter, 4,508,919, Cl. 562-401.000.

Bradley, Fennimore N., to Midwest Components, Inc. Thermally actuated switch. 4,509,029, Cl. 335-208.000.

Bradshaw, Cyril E.: *See*—
Kelly, William W.; and Bradshaw, Cyril E., 4,508,134, Cl. 137-103.000.

Brannon, James H.; and Lankard, John R., Sr., to International Business Machines Corporation. Patterning of polyimide films with ultraviolet light. 4,508,749, Cl. 427-43.100.

Brault, Robert G., to Hughes Aircraft Company. Method of applying poly(methacrylic anhydride resist to a semiconductor. 4,508,812, Cl. 430-270.000.

Brazener, David J., to Smiths Industries Public Limited Company. Aircraft instruments. 4,507,959, Cl. 73-182.000.

Bredow, Walter, to C. Behrens AG. Arrangement for removing workpieces from a cutting press. 4,507,995, Cl. 83-153.000.

Bremer, Gordon; and Betts, William L., to Paradyne Corporation. Modem multiplexer synchronization by radial modulation. 4,509,171, Cl. 370-100.000.

Brett, C. Everett: *See*—
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Bretz, Frank E., to Ajax Consolidated Co. Vehicle refrigeration unit and mounting assembly. 4,507,937, Cl. 62-298.000.

Brewer, Jack W.: *See*—
Kim, Chong Y.; Farver, Terry F.; and Brewer, Jack W., 4,508,825, Cl. 435-201.000.

Bridger, Nevill J.: *See*—
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Bridgestone Corporation: *See*—
Tanaka, Tsutomu; Yahagi, Mitsuhisa; and Watanabe, Shuichi, 4,508,153, Cl. 152-362.0CS.

Bridgestone Tire Company Limited: *See*—
Nomoto, Sadao; and Iida, Kazuyoshi, 4,509,061, Cl. 346-107.00R.
Sano, Shigehisa; Seto, Isao; Koseki, Hiroyuki; and Minomura, Mana, 4,508,152, Cl. 152-356.00R.

Brigham Young University: *See*—
Clegg, John C.; and Davis, Ariel R., 4,508,996, Cl. 315-224.000.

Brindle, Robert J., to James Burn International Limited. Holders for computer disks and the like. 4,508,366, Cl. 281-36.000.

Bristol-Myers Company: *See*—
Hatori, Masami; Ohkuma, Hiroaki; Konishi, Masataka; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,508,647, Cl. 260-239.30T.

British Petroleum Company p.l.c., The: *See*—
Croo, Robert J., 4,508,460, Cl. 374-16.000.
Broken Hill Proprietary Company Limited, The: *See*—
Salm, Dietmar F. E., 4,508,480, Cl. 413-1.000.
Brooks, Dave W.: *See*—
Choinski, Graydon J.; and Brooks, Dave W., 4,508,018, Cl. 92-128.000.
Brose Fahrzeugteile GmbH & Co. Kommanditgesellschaft: *See*—
Hofmann, Hans-Otto, 4,508,386, Cl. 297-346.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Mizuno, Shigeru; Suzuki, Masahiko; Mizuno, Haruki; and Katsu, Masutaro, 4,508,567, Cl. 75-231.000.
Broussoux, Dominique; Facoetti, Hugues; and Micheron, Francois, to Thomson-CSF. Method of fabrication of piezoelectric polymer transducers by forging. 4,508,668, Cl. 264-22.000.
Brown, Charles D.: *See*—
Mills, Stephen D.; and Brown, Charles D., 4,508,247, Cl. 222-598.000.
Brown, Dewey E. Bow sight. 4,507,874, Cl. 33-265.000.
Brown, George T. Pipe repair bypass system. 4,508,129, Cl. 137-15.000.
Brown, Michael M.: *See*—
Hickman, Mark R.; and Brown, Michael M., 4,508,976, Cl. 307-270.000.
Brown, Phillip P.: *See*—
Wang, An; and Brown, Phillip P., 4,508,463, Cl. 400-124.000.
Brown, Robert A., to Acushnet Company. Fast thermal response mold. 4,508,309, Cl. 249-81.000.
Brown, Robert L.; Jones, William A.; and Anderson, Daryl E., to GenCorp Inc. Tire bead turn-up device. 4,508,586, Cl. 156-401.000.
Brtnik, Frantisek: *See*—
Simek, Petr; Barth, Tomislav; Brtnik, Frantisek; Jost, Karel; Machova, Alena; Servitova, Linda; and Slantinova, Jirina, 4,508,645, Cl. 260-112.50R.
Bruel, Michel; Escaron, Jean; and Labartino, Joseph, to Commissariat a l'Energie Atomique. Target holder with mechanical scanning. 4,508,056, Cl. 118-730.000.
Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, to Ciba Geigy Corporation. Certain pyridylacetylene compounds, compositions containing same and herbicidal methods of use. 4,508,560, Cl. 71-94.000.
Bruns, Engelbert: *See*—
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, 4,508,596, Cl. 202-227.000.
Brush, Robert W., Sr.; and Werth, Dee A., to Allied Corporation. Electrical connector assembly having an anti-decoupling device. 4,508,406, Cl. 339-89.00M.
Bryant, Frank R.: *See*—
Ackmann, Paul W.; and Bryant, Frank R., 4,508,815, Cl. 430-314.000.
BST Lift Systems, Inc.: *See*—
Becker, Billy G.; and Swafford, Charles V., 4,508,166, Cl. 166-117.500.
Buckl, Hans, to Sud Chemie Aktiengesellschaft. Compositions containing thiolates for removal of heavy metal ions from dilute aqueous solutions. 4,508,838, Cl. 502-62.000.
Buelow, Jack; and Darland, Michael A., to Clorox Company, The. Toilet bowl dispenser. 4,507,811, Cl. 4-225.000.
Buenzli, Charles W., Jr.: *See*—
Shaber, Gary S.; and Buenzli, Charles W., Jr., 4,508,686, Cl. 422-55.000.
Buggert, Peter O., to Oktan Aktiebolag. Arrangement in the combustion chamber of an internal combustion engine. 4,508,070, Cl. 123-193.0CP.
Buhart, Andre , to Thomson-CSF. Channel formation system for panoramic sonars. 4,509,152, Cl. 367-123.000.
Bui, Ngoc C.: *See*—
Monbaron, Jean-Jacques; and Bui, Ngoc C., 4,509,133, Cl. 364-513.500.
Bunnell, Edward D., to AMP Incorporated. Shielded electrical connector for flat cable. 4,508,415, Cl. 339-143.00R.
Bunz, Lewis A.: *See*—
Schachter, Rozalie; Viscogliosi, Marcello; and Bunz, Lewis A., 4,509,066, Cl. 357-2.000.
Buren, Kurt J. A.: *See*—
Leirnes, Johan S.; Lundstrom, Malkolm S.; Hedlund, Martin L.; and Buren. Kurt J. A., 4,508,565, Cl. 75-77.000.
Burger, William A.; Embree, David M.; Singer, Martin H.; and Vogelpohl, David R., to AT&T Information Systems Inc.; and Bell Telephone Laboratories, Inc. Method and circuitry for encoding telephone ringing signals. 4,508,937, Cl. 179-84.00T.
Burlington Industries, Inc.: *See*—
Morrison, Elbert F., 4,507,913, Cl. 57-328.000.
Burr-Brown Corporation: *See*—
Wolfson, Sumner H., 4,507,907, Cl. 53-478.000.
Burr, David J.: *See*—
Ackland, Bryan D.; Burr, David J.; and Weste, Neil H. E., 4,509,187, Cl. 381-43.000.
Burroughs Corporation: *See*—
Page, David W.; and Peterson, LuVerne R., 4,508,977, Cl. 307-468.000.
Sprenkle, George J., 4,507,861, Cl. 29-741.000.
Burrus, Harry O., to Du Pont de Nemours, E. I., and Company. Hypochlorite destruction using urea. 4,508,697, Cl. 423-499.000.
Bush, J. Finley; and Gaydoski, Gary F., to Aluminum Company of America. Aluminum-fluorine compound manufacture. 4,508,689, Cl. 423-127.000.
Busta, Heinz H.; Tsao, Kuey-Yeou; White, Wayne D.; and Loeppert, Peter V., to Gould Inc. Miniaturized potassium ion sensor. 4,508,613, Cl. 204-418.000.
Butenop, Klaus: *See*—
Singer, Klaus-Peter; and Butenop, Klaus, 4,508,289, Cl. 242-107.40B.
Byrt, Graham A. B. Sheet stacking apparatus. 4,508,333, Cl. 271-218.000.
C. Behrens AG: *See*—
Bredow, Walter, 4,507,995, Cl. 83-153.000.
Cabrera, Pedro P., to Coulter Electronics, Inc. Liquid metering and transfer valve assembly. 4,507,977, Cl. 73-864.120.
Cain, Michael H.: *See*—
Sircar, Ila; Cain, Michael H.; and Topliss, John G., 4,508,718, Cl. 514-238.000.
Cairns & Brother, Inc.: *See*—
Coombs, Christopher E., 4,507,806, Cl. 2-85.000.
Calamai, Edward G.; and Daigle, Martha A., to Baxter Travenol Laboratories, Inc. Rat antibody to hCG. 4,508,643, Cl. 260-112.00B.
Calisi, Constance M. Pressure monitoring interconnect system. 4,508,103, Cl. 128-673.000.
Calutoiu, Nicolae I. Ambulatory sleeping bag. 4,507,805, Cl. 2-69.500.
Calvin, Donald W.: *See*—
Leathers, Joel F. M.; and Calvin, Donald W., 4,508,538, Cl. 23-313.00R.
Cameca: *See*—
Boissel, Pierre; and Tong, Mathias, 4,508,967, Cl. 250-396.00R.
Cameron Iron Works, Inc.: *See*—
Just, Friedrich E.; and Williams, Bolie C., III, 4,508,311, Cl. 251-1.00B.
Taylor, William M.; and Williams, Bolie C., III, 4,508,312, Cl. 251-1.00A.
Campbell, Ian N.: *See*—
Keir, Grant G. H.; Peebles, John A.; McNab, Jonas K.; and Campbell, Ian N., 4,508,260, Cl. 232-43.100.
Campbell, Willis R.; Hunt, Larry J.; and Waldrop, T. William, to Sperry Corporation. Automatic latch for draft member of bale handler. 4,508,359, Cl. 280-463.000.
Camps, Marcel; Douillard, Alain; Dubois, Jean-Claude; Gazard, Maryse; Montheard, Jean-Pierre; Pascal, Thierry; and Seytre, Gerard, to Thomson-CSF. Polymers containing heterocycles and aromatic nuclei, and conductive organic materials made from such polymers. 4,508,639, Cl. 252-500.000.
Canadian Patents & Dev. Limited: *See*—
Ayer, John B., 4,509,102, Cl. 361-92.000.
Canham, Kevin, to Allied Corporation. Electrical termination system and connector member. 4,508,410, Cl. 339-99.00R.
Cann, Kevin J.: *See*—
Beran, Debra L.; Cann, Kevin J.; Jorgensen, Robert J.; Karol, Frederick J.; Maraschin, Norma J.; and Marcinkowsky, Arthur E., 4,508,842, Cl. 502-112.000.
Canon Kabushiki Kaisha: *See*—
Harada, Yuji, 4,508,428, Cl. 350-337.000.
Hirohata, Michio, 4,508,442, Cl. 354-400.000.
Ishiwata, Kazuya, 4,508,792, Cl. 428-702.000.
Kitagishi, Nozomu; and Tsuji, Sadahiko, 4,508,433, Cl. 350-454.000.
Ohara, Tsunemasa; Suzuki, Masayuki; and Yamamichi, Masayoshi, 4,508,439, Cl. 354-154.000.
Sugitani, Hiroshi; Inamoto, Tadayoshi; and Yokota, Masami, 4,509,063, Cl. 346-140.00R.
Caolo, Mary A.: *See*—
Bartlett, Keith G.; and Caolo, Mary A., 4,508,591, Cl. 156-659.100.
Caramel, Rudolf: *See*—
Schlick, Horst; Hofert, Paul; and Caramel, Rudolf, 4,508,458, Cl. 368-76.000.
Card-O-Matic Pty. Limited: *See*—
Stanley, Louis, 4,507,947, Cl. 72-130.000.
Carl Still GmbH & Co. KG, Firma: *See*—
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, 4,508,596, Cl. 202-227.000.
Carlo Erba Strumentazione S.p.A.: *See*—
Sisti, Giorgio; and Verga, Giuseppe, 4,508,685, Cl. 422-54.000.
Carlson, Elmer V., to Industrial Research Products, Inc. Miniature acoustical transducer with filter/regulator power supply circuit. 4,509,193, Cl. 381-113.000.
Carlson, Roger W., to Amana Refrigeration, Inc. Microwave cooking method. 4,508,948, Cl. 219-10.55M.
Carmichael, Kathleen M.: *See*—
Tokoli, Emery G.; Horgan, Anthony M.; and Carmichael, Kathleen M., 4,508,650, Cl. 260-245.860.
Carpe, Michel; Collin, Claude; and Pontif, Marc, to Thomson-CSF. Receiver for multicarrier signals protected from unwanted signals. 4,509,206, Cl. 455-245.000.
Carpino, Louis A.; and Cohen, Beri, to Research Corporation. Peptide synthesis and amino acid blocking agents. 4,508,657, Cl. 260-463.000.
Carrington, Michael R. Pass-blocking sled. 4,508,341, Cl. 273-55.00R.
Carroll, Frank E. Sheet metal structural shape and use in building structures. 4,507,901, Cl. 52-302.000.
Carroll, William R. Log conveying apparatus. 4,508,149, Cl. 144-245.00A.
Carter, Don E.; and Yuen, Henry K., to Monsanto Company. Thermal energy storage system. 4,508,101, Cl. 126-436.000.
Carter, Timothy J. N.; and Dahne, Claus, to Battelle Memorial Institute. Ellipsometrically measuring rate of optical change in immunoassay. 4,508,832, Cl. 436-517.000.

Cartwright, David, to Imperial Chemical Industries, PLC. 2,3-Dichloro-5-trichloromethylpyridine. 4,508,907, Cl. 546-345.000.
Carvel Corporation: *See*—
Carvel, Thomas, 4,508,933, Cl. 174-67.000.
Carvel, Thomas, to Carvel Corporation. Electric outlet cover. 4,508,933, Cl. 174-67.000.
Casagrande, Cesare: *See*—
Tricerri, Silvia Z.; Casagrande, Cesare; De Marchi, Franco; and Nicola, Massimo, 4,508,719, Cl. 514-236.000.
Casciani, James R., to Hewlett-Packard Company. Uniaxially collimated light source for optical shaft angle encoders. 4,508,965, Cl. 250-231.05E.
Casciotti, Albert; McCleerey, Earl W.; and Cosmos, Pete, to AMP Incorporated. Woven cable connector. 4,508,401, Cl. 339-14.00R.
Cash, Carlton H., to Georgia Tech Research Institute. RF Interferometer/Doppler target location system. 4,509,052, Cl. 343-418.000.
Casio Computer Co., Ltd.: *See*—
Haruhara, Kazuyoshi, 4,508,462, Cl. 400-70.000.
Castelot, Lawrence E.; and Castelot, Linda A. Pregnancy-supporting lounge chair. 4,508,384, Cl. 297-284.000.
Castelot, Linda A.: *See*—
Castelot, Lawrence E.; and Castelot, Linda A., 4,508,384, Cl. 297-284.000.
Catrambone, Joel, to A. J. Sparks & Company. Preformed pot cover package. 4,508,223, Cl. 206-423.000.
Cattaneo, Christian J.; Derouet, Patrick R. J.; and Laroche, Michel C. F., to S.N.E.C.M.A. Device for detecting and preventing the formation of ice on contoured surfaces. 4,508,295, Cl. 244-134.00A.
Cecic, Norma: *See*—
Cecic, Tihomir; and Cecic, Norma, 4,508,714, Cl. 424-195.100.
Cecic, Tihomir; and Cecic, Norma. Organic scalp lotion. 4,508,714, Cl. 424-195.100.
Cedrone, Nicholas J. Lead combing apparatus for radial lead electronic devices. 4,509,010, Cl. 324-158.00P.
Celanese Corporation: *See*—
Kiss, Gabor D., 4,507,983, Cl. 74-572.000.
Central Glass Company Limited: *See*—
Miyoshi, Takao; and Sakanoue, Akira, 4,508,761, Cl. 427-221.000.
Central Sprinkler Corporation: *See*—
Pieczykolan, George S., 4,508,175, Cl. 169-38.000.
Centre National d'Etudes Spatiales: *See*—
Mouilhayrat, Guy G.; Duchon, Paul A. J.; Guilbert, Jean M. A. M.; and Rolfo, Andre A., 4,508,297, Cl. 244-173.000.
Ceskoslovenska akademie ved: *See*—
Simek, Petr; Barth, Tomislav; Brtnik, Frantisek; Jost, Karel; Machova, Alena; Servitova, Linda; and Slantinova, Jirina, 4,508,645, Cl. 260-112.50R.
Chamberlain, Terence R., to Sun Chemical Corporation. Nickel complex pigments of bis-azomethines. 4,508,899, Cl. 544-225.000.
Champion International Corporation: *See*—
Dutcher, Daniel P., 4,508,526, Cl. 493-346.000.
Chang, Ching-Te; Lee, Lian-Tze; and Su, Hsueh-Ling, to Industrial Technology Research Institute. Preparation of bis-carboxy ethyl germanium sesquioxide and its propionic acid derivatives. 4,508,654, Cl. 260-429.00R.
Chapa, Roman; and Baumgarten, Ronald, to Chapa, Roman. System combining water heater and refrigeration unit. 4,507,933, Cl. 62-184.000.
Charles I. Brown: *See*—
Forrest, William E., 4,508,193, Cl. 182-5.000.
Chas. M. Bailey Co., Inc.: *See*—
Dixon, Robert W., 4,508,138, Cl. 137-239.000.
Charles, Paul A. S., to Ingersoll Milling Machine Company, The. Tape-laying head. 4,508,584, Cl. 156-353.000.
Chaudhuri, Dwaipayan; and Stebles, Malcolm R., to Lever Brothers Company. Skin treatment composition. 4,508,705, Cl. 424-47.000.
Chaumette, Jacques: *See*—
Aubry, Claude; Chaumette, Jacques; and Touchon, Pierre, 4,508,783, Cl. 428-410.000.
Chemische Werke Huls Ag: *See*—
Kurandt, Hans-Friedrich; and Kampner, Karl-Heinz, 4,508,574, Cl. 106-109.000.
Chen, Chin-Long, to International Business Machines Corporation. Double error correction - triple error detection code. 4,509,172, Cl. 371-38.000.
Chen, Tsu F.; and Phillips, Edwin R., to Sperry Corporation. Drilling monitor. 4,507,834, Cl. 29-26.00R.
Cheney, Richard F., to GTE Products Corporation. Plasma spray powder. 4,508,788, Cl. 428-570.000.
Chernin, Mikhail M.: *See*—
Maltsev, Jury S.; Shevchenko, Viktor D.; and Chernin, Mikhail M., 4,509,134, Cl. 364-813.000.
Cherry, Hitesh; and Werner, Walter M., to AMP Incorporated. Insulation piercing coaxial grip splice device. 4,508,409, Cl. 339-97.00R.
Cheung, Kin L., to Wang Laboratories, Inc. Data transmitting link. 4,509,140, Cl. 364-900.000.
Chevron Research Company: *See*—
Fox, Richard C., 4,508,568, Cl. 106-2.000.
Zones, Stacey I., 4,508,837, Cl. 502-62.000.
Chi Rho Corporation: *See*—
Llewellyn, Link W., 4,508,339, Cl. 273-26.00E.
Chianelli, Russell R.; and Pecoraro, Theresa A., to Exxon Research & Engineering Co. Carbon-containing molybdenum and tungsten sulfide catalysts. 4,508,847, Cl. 502-200.000.
Chiarella, Anthony A.: *See*—
Lerman, Michael J.; Koehl, Richard; Chiarella, Anthony A.; and Zamory, William, 4,508,455, Cl. 366-247.000.
Chicago Rawhide Manufacturing Company: *See*—
Szcupak, Peter, 4,508,020, Cl. 92-168.000.
Chicopee: *See*—
Malaney, Frank E., 4,508,113, Cl. 128-132.00D.
Childers, Jimmie D., to Texas Instruments Incorporated. Semiconductor memory device with pipeline access. 4,509,142, Cl. 364-900.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Fogassy, Elemer; Toke, Laszlo ; Faigl, Ferenc; Soos, Rudolf; Bozzay, Jozsef; Kolta, Rezso; Nemes, Jozsef; and Bencsik, Peter, 4,508,919, Cl. 562-401.000.
Huhn, Magda; Szabo, Gabor; Dvortsak, Peter; Karpati, Marianna; and Somfai, Eva, 4,508,658, Cl. 260-465.00D.
Chisso Corporation: *See*—
Ishibashi, Tadao; and Kugimiya, Youichi, 4,508,786, Cl. 428-461.000.
Chloride Group Public Limited Company: *See*—
Pearson, Ernest J., 4,507,856, Cl. 29-623.100.
Choe, Francis S. O., to 501 Lamipak Industries (Europe) Ltd. Plastic bags. 4,508,222, Cl. 206-390.000.
Choffin, Justin C. Telescopically extendable pole. 4,508,467, Cl. 403-104.000.
Choi, Smith: *See*—
Gebauer, Paul W.; and Choi, Smith, 4,508,349, Cl. 273-175.000.
Choinski, Graydon J.; and Brooks, Dave W., to Thyssen-Bornemisza, Inc. Boot assembly for brake actuator. 4,508,018, Cl. 92-128.000.
Chow, Richard H.; and Geering, Emil J., to Occidental Chemical Corporation. Method for the decolorization of aroyl chloride compositions. 4,508,661, Cl. 260-544.00D.
Chow, Richard H.; and Geering, Emil J., to Occidental Chemical Corporation. Color-stabilized aroyl chloride compositions. 4,508,857, Cl. 260-544.00D.
Christe, Karl O.: *See*—
Schack, Carl J.; and Christe, Karl O., 4,508,662, Cl. 260-550.000.
Churchland, Mark T.; and Parker, David, to MacMillan Bloedel Limited. Pressed composite assembly and method. 4,508,772, Cl. 428-106.000.
Ciba Geigy Corporation: *See*—
Bedekovic, Davor; and Fletcher, Ian J., 4,508,897, Cl. 544-127.000.
Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, 4,508,560, Cl. 71-94.000.
Erzinger, Paul; and Lappie, Arnulf R., 4,508,536, Cl. 8-639.000.
Guglielmetti, Leonardo, 4,508,784, Cl. 252-301.210.
Riebli, Peter; Fischer, Hanspeter; Thummel, Rudolph C.; and Hubele, Adolf, 4,508,731, Cl. 514-472.000.
Schaffner, Karl; and Scartazzini, Riccardo, 4,508,723, Cl. 514-195.000.
Spivack, John D.; and Pastor, Stephen D., 4,508,865, Cl. 524-283.000.
Cigognini, Silvio, to Socimi, S.p.A. High performance disc brake. 4,508,200, Cl. 188-264.00P.
Citizen Watch Co., Ltd.: *See*—
Suzuki, Fuminori, 4,508,000, Cl. 84-1.010.
CKD Corporation: *See*—
Ogasawara, Yoshinari, 4,508,143, Cl. 137-636.100.
Claassen, George R.: *See*—
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Clantex Limited: *See*—
Houlbrook, Kenneth; and Thornton, Paul A., 4,508,245, Cl. 222-327.000.
Clarion Co., Ltd.: *See*—
Wada, Hideo, 4,508,048, Cl. 116-291.000.
Clark, Keith H., to United States of America, National Aeronautics and Space Administration. Hemispherical latching apparatus. 4,508,296, Cl. 244-158.00R.
Clarke, David E., to Lever Brothers Company. General-purpose cleaning composition comprising nonionic surfactant and alcohol esterified resin copolymer. 4,508,635, Cl. 252-174.230.
Clavier, Philippe A. Solar furnace. 4,508,099, Cl. 126-400.000.
Clegg, John C.; and Davis, Ariel R., to Brigham Young University. High frequency supply system for gas discharge lamps and electronic ballast therefor. 4,508,996, Cl. 315-224.000.
Clifford, Mona. Method for psychomotor training of physical skills. 4,508,510, Cl. 434-247.000.
Clorox Company, The: *See*—
Buelow, Jack; and Darland, Michael A., 4,507,811, Cl. 4-225.000.
Cloutier, Frank L.: *See*—
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CMD Enterprises, Inc.: *See*—
Taylor, Noel R.; and Taylor, Paul A., 4,508,487, Cl. 417-12.000.
Coash, Ronald J.: *See*—
Davis, John E.; Zielke, Terry L.; and Coash, Ronald J., 4,508,269, Cl. 239-177.200.
Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, to General Tire & Rubber Company, The. In-mold coating. 4,508,785, Cl. 428-424.400.
Coca Cola Company, The: *See*—
Kruger, Albert J., Jr.; and Johnson, John K., 4,508,744, Cl. 426-590.000.
Cogswell, Frederic N.: *See*—
Bailey, Derrick S.; Cogswell, Frederic N.; and Griffin, Brian P., 4,508,891, Cl. 528-191.000.

Cohen, Abraham B.: *See*—
Heiart, Robert B.; and Cohen, Abraham B., 4,508,802, Cl. 430-22.000.

Cohen, Beri: *See*—
Carpino, Louis A.; and Cohen, Beri, 4,508,657, Cl. 260-463.000.

Cohen, Martin G.: *See*—
Daly, Richard T.; and Cohen, Martin G., 4,509,175, Cl. 372-101.000.

Coingt, Michel, to Produits Chimiques Ugine Kuhlmann. Cyclic process for the production of hydrogen peroxide. 4,508,696, Cl. 423-588.000.

Coleman, James H., to Upjohn Company, The. Treatment of panic disorders with alprazolam. 4,508,726, Cl. 514-220.000.

Collin, Claude: *See*—
Carpe, Michel; Collin, Claude; and Pontif, Marc, 4,509,206, Cl. 455-245.000.

Collins and Aikman Corporation: *See*—
Peoples, Clarence, Jr.; Puydak, Robert C.; and Jansen, Deborah S., 4,508,771, Cl. 428-95.000.

Collmann, Wilhelm. Spacer device for a tire processing machine. 4,508,498, Cl. 425-58.000.

Colt Industries Operating Corp: *See*—
Wakeman, Russell J., 4,508,091, Cl. 123-586.000.

Columbia Research Laboratories: *See*—
Stratton, Leo M.; Sipple, Kenneth J.; and Tatonetti, Mario B., 4,507,965, Cl. 73-517.00B.

Combustion Engineering, Inc.: *See*—
Palmer, David N., 4,508,608, Cl. 204-192.00C.

Comdial Technology Corporation: *See*—
Lawson, Robert; Augustus, Jimmie R.; Corless, Robert; and Kardash, John, 4,508,939, Cl. 179-90.00B.

Comdial Telephone Systems, Inc.: *See*—
Bench, Ronald W.; and Hineline, Edson S., Jr., 4,508,938, Cl. 179-90.0BD.

Commissariat a l'Energie Atomique: *See*—
Bruel, Michel; Escaron, Jean; and Labartino, Joseph, 4,508,056, Cl. 118-730.000.
Costes, Didier, 4,508,678, Cl. 376-205.000.

Community Light & Sound Inc.: *See*—
Wiggins, John T., 4,508,941, Cl. 179-115.5PC.

Compagnie Generale de Geophysique: *See*—
Manin, Michel, 4,508,191, Cl. 181-107.000.

Compagnie Generale d'Electricite: *See*—
Lacour, Bernard; Maillet, Marc; Vannier, Chantal; and de Witte, Olivier, 4,509,174, Cl. 372-82.000.

Compagnie Generale des Etablissements Michelin: *See*—
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Condair AG: *See*—
Ruoss, Erwin; and Sieber, Kurt, 4,508,551, Cl. 55-263.000.

Conklin, Russell W.: *See*—
Amoroso, Salvatore, Jr.; and Conklin, Russell W., 4,509,050, Cl. 343-5.0SM.

Conn, Andrew F.; Lindenmuth, William T.; and Frederick, Gary S., to Tracor Hydronautics, Inc. Fluid jet apparatus and method for cleaning tubular components. 4,508,577, Cl. 134-1.000.

Conrad, Lucas J., to R. J. Reynolds Tobacco Company. End seal for rotary treating drum. 4,507,876, Cl. 34-242.000.

Consigny, Claude. Finger-guard. 4,507,804, Cl. 2-21.000.

Constructions Mecaniques de Normandie: *See*—
Bordat, Andre J. E., 4,508,047, Cl. 114-355.000.

Conti, Allen C. Tape and method for measuring and/or pulling cable. 4,508,317, Cl. 254-134.3FT.

Contrinex S.A.: *See*—
Heimlicher, Peter, 4,509,023, Cl. 331-176.000.

Control Data Corporation: *See*—
Gagne, Donald J., 4,508,418, Cl. 339-253.00R.

Cook, Dudley D., Jr.: *See*—
Graham, Marshall D.; Cook, Dudley D., Jr.; Gecks, Donald L.; and Shaw, Robert, 4,508,435, Cl. 350-529.000.

Cookerly, Jack C.: *See*—
Hall, George R.; Hall, Robert J.; and Cookerly, Jack C., 4,508,002, Cl. 84-1.030.

Coombs, Christopher E., to Cairns & Brother, Inc. Protective garment. 4,507,806, Cl. 2-85.000.

Cooperman, Michael: *See*—
Kapral, Christopher W.; and Cooperman, Michael, 4,508,982, Cl. 307-572.000.

CooperVision, Inc.: *See*—
Wittmann, Joseph W.; and Evans, John M., 4,508,884, Cl. 526-279.000.

Coplan, Myron J.: *See*—
Bikson, Benjamin; Coplan, Myron J.; and Gotz, Gertrud, 4,508,852, Cl. 521-27.000.

Coppola, Richard G.; and Stephens, George H., to Sangamo Weston, Inc. Solid-state electrical-power demand register and method. 4,509,128, Cl. 364-483.000.

Corbett, Colin D.; Milloch, Robert L.; and Sarno, Felicisimo S., to Star-Kist Foods, Inc. Coated pet food and process for preparation thereof. 4,508,741, Cl. 426-303.000.

Corder, Thomas E.: *See*—
Pfeiffer, James W.; and Corder, Thomas E., 4,508,943, Cl. 200-17.00R.

Coret & Company, Ltd.: *See*—
Kojima, Satoru, 4,508,328, Cl. 269-236.000.

Corless, Robert: *See*—
Lawson, Robert; Augustus, Jimmie R.; Corless, Robert; and Kardash, John, 4,508,939, Cl. 179-90.00B.

Cormier, William E., Jr.; Pasquale, Gary M.; and Stover, William A., to Mobil Oil Corporation. Method of preparing a high-density cracking catalyst with reduced sulfur emissions from coke. 4,508,840, Cl. 502-70.000.

Corning Glass Works: *See*—
Baker, Richard, 4,509,212, Cl. 455-612.000.
Rajnik, Lawrence S., 4,508,031, Cl. 101-41.000.

Cosmos, Pete: *See*—
Casciotti, Albert; McCleerey, Earl W.; and Cosmos, Pete, 4,508,401, Cl. 339-14.00R.

Costa, Peter F.; and Whiteside, George D., to Polaroid Corporation. Bellows shielding structure. 4,508,440, Cl. 354-187.000.

Costes, Didier, to Commissariat a l'Energie Atomique. Liquid metal-cooled nuclear reactor. 4,508,678, Cl. 376-205.000.

Coulter Electronics, Inc.: *See*—
Cabrera, Pedro P., 4,507,977, Cl. 73-864.120.
Graham, Marshall D.; Cook, Dudley D., Jr.; Gecks, Donald L.; and Shaw, Robert, 4,508,435, Cl. 350-529.000.

Coulter, James C.; and Shannon, Michael P., to Shannon, Michael P. Wind surfing hydrofoil apparatus. 4,508,046, Cl. 114-39.000.

Coulson, William F.: *See*—
Baker, Terence S.; and Coulson, William F., 4,508,830, Cl. 436-510.000.

Coviello, John S.: *See*—
Agnew, Palmer W.; Coviello, John S.; Green, Linda S.; and Kellerman, Anne S., 4,509,122, Cl. 364-200.000.

Cowell, Peter A.; and Herbert, Paul F. Tractor linkage with pitch altitude control connected to sensor ram. 4,508,178, Cl. 172-239.000.

Coy, David H.; and Murphy, William A., to American Cyanamid Company. Cyclic pentapeptide displaying somatostatin antagonism and method of treatment of mammals therewith. 4,508,711, Cl. 514-11.000.

CPC International Inc.: *See*—
Hamm, Donald J., 4,508,746, Cl. 426-601.000.
Mudde, John P., 4,508,576, Cl. 106-213.000.

CPG Products Corp.: *See*—
Cummings, Charles A., 4,508,509, Cl. 434-88.000.

Craig, Edwin R.; and Blumberg, Ben, Jr., to General Electric Company. Modular nuclear reactor for a land-based power plant and method for the fabrication, installation and operation thereof. 4,508,677, Cl. 376-174.000.

Crameri, Yvo; Ochsner, Paul A.; and Schudel, Peter, to Givaudan Corporation. 3-Phenyl-propionaldehydes. 4,508,925, Cl. 568-442.000.

Crammond, James: *See*—
Oehlke, Donald N.; MacRae, Ralph A.; Crammond, James; and Rattmann, Hans R., 4,508,477, Cl. 411-174.000.

Crawford, Lester M.: *See*—
Booth, Nicholas H.; Hatch, Roger C.; and Crawford, Lester M., 4,508,715, Cl. 514-280.000.

Creager & Company: *See*—
Creager, Robert L., Sr., 4,509,139, Cl. 364-900.000.

Creager, Robert L., Sr., to Creager & Company. Binary data storage and retrieval system for serial interface communications and archival access. 4,509,139, Cl. 364-900.000.

Crevling, Robert L., Jr.: *See*—
Berfield, Robert C.; Crevling, Robert L., Jr.; and Lawson, Lonnie B., Jr., 4,508,550, Cl. 55-216.000.

Criss, Russell C.: *See*—
Gillery, F. Howard; and Criss, Russell C., 4,508,789, Cl. 428-630.000.

Croo, Robert J., to British Petroleum Company p.l.c., The. Process and apparatus for continuous measurement of the pour point of oil. 4,508,460, Cl. 374-16.000.

Crostack, Horst-Artur. Method and means for imaging sound waves. 4,507,966, Cl. 73-603.000.

Cummings, Charles A., to CPG Products Corp. Device for making preselected composite designs. 4,508,509, Cl. 434-88.000.

Curt G. Joa, Inc.: *See*—
Hirsch, John L.; and VanVoorst, Gene A., 4,508,528, Cl. 493-426.000.

Curulla, Michael V.: *See*—
Matzner, Bruce; Horn, Victor M.; Curulla, Michael V.; and Price, John F., 4,508,679, Cl. 376-438.000.

Czarnetzky, Edward J.: *See*—
Forest, Joseph G.; and Czarnetzky, Edward J., 4,508,737, Cl. 426-54.000.

Czernicki, Thomas R.: *See*—
Litt, Frederic A.; and Czernicki, Thomas R., 4,508,630, Cl. 252-32.500.

Dabi, Shmuel, to Personal Products Company. Quaternized cellular polymers from amine terminated poly(aminoethers) and polyfunctional epoxides. 4,508,854, Cl. 521-178.000.

Daggett, Charles W., to Littelfuse, Inc. Fuse holder. 4,508,412, Cl. 339-126.00R.

Dahan, Israel. Holder for sheet-like objects. 4,507,830, Cl. 24-527.000.

Dahne, Claus: *See*—
Carter, Timothy J. N.; and Dahne, Claus, 4,508,832, Cl. 436-517.000.

Dai Nippon Tokyo Co., Ltd: *See*—
Hokamura, Sadakazu; Shinohara, Toshio; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,508,767, Cl. 427-407.100.

Daicel Chemical Industries Ltd.: *See—*
Koyama, Takahiro; Matsumura, Haruo; and Morita, Teturo, 4,508,893, Cl. 536-85.000.
Daicel Chemical Industris Ltd.: *See—*
Omiya, Takeo, 4,508,894, Cl. 536-89.000.
Daigle, Martha A.: *See—*
Calamai, Edward G.; and Daigle, Martha A., 4,508,643, Cl. 260-112.00B.
Dailey Petroleum Services Corp.: *See—*
Anders, Edward O., 4,508,182, Cl. 175-61.000.
Daimler-Benz Aktiengesellschaft: *See—*
Dobler, Helmut; Zeller, Rolf; and Seitz, Helmut, 4,508,069, Cl. 123-192.00B.
Drometer, Klaus, 4,508,393, Cl. 303-111.000.
Dainichi-Nippon Cables, Ltd.: *See—*
Kusui, Akio; Morita, Shuji; Kudoh, Toshio; Tanaka, Yasuo; and Itoh, Hirotaka, 4,508,414, Cl. 339-143.00R.
Suzuki, Koichi; Oose, Seiroku; So, Yuzo; and Hirao, Yasutaka, 4,509,104, Cl. 362-32.000.
Dainippon Screen Mfg. Co., Ltd.: *See—*
Yamada, Mitsuhiko, 4,509,046, Cl. 340-815.100.
Daly, Richard T.; and Cohen, Martin G., to Quantronix Corporation. Segmented YAG laser rods and method of manufacture. 4,509,175, Cl. 372-101.000.
Damon, Neil F.; and Rydwansky, Frank C., Jr., to Augat Inc. Electronic socket having spring probe contacts. 4,508,405, Cl. 339-75.0MP.
Dana Corporation: *See—*
Hinkle, Donald H., 4,507,837, Cl. 29-262.000.
D'Andrade, Bruce M.; and Sing Chuen, Johnny Y., to Arco Industries Ltd. Steering system and reversible drive for toy vehicles. 4,508,516, Cl. 446-443.000.
Danfoss A/S: *See—*
Pedersen, Svend P.; Molbaek, Jens J.; and Hansen, Allan H., 4,508,262, Cl. 236-42.000.
Pedersen, Svend P.; Wrang, Soren N.; and Molbaek, Jens J., 4,508,263, Cl. 236-42.000.
Danko, Peter, to Bed Store, The. Platform bed and corner connector. 4,507,815, Cl. 5-400.000.
Darland, Michael A.: *See—*
Buelow, Jack; and Darland, Michael A., 4,507,811, Cl. 4-225.000.
Darton, Richard C.: *See—*
Voetter, Heinz; Darton, Richard C.; Van Meurs, Hubrecht C. A.; and Krishna, Rajamani, 4,508,041, Cl. 110-347.000.
DasGupta, Sujan; and Purvis, Merton B., to AT&T Bell Laboratories. Electrical printed wiring circuit board construction. 4,509,098, Cl. 361-398.000.
DasGupta, Sumit; Graf, Matthew C.; Rasmussen, Robert A.; and Williams, Thomas W., to International Business Machines Corporation. Method of concurrently testing each of a plurality of interconnected integrated circuit chips. 4,509,008, Cl. 324-73.00R.
Dassler, Armin, to PUMA-Sportschuhfabriken Rudolk Dassler KG. Athletic shoe sole, particularly a soccer shoe, with a springy-elastic sole. 4,507,879, Cl. 36-102.000.
Datta, Amitava: *See—*
Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., 4,508,257, Cl. 228-263.130.
Daudelin, Douglas S., to Bell Telephone Laboratories, Inc. Variable cycle-time microcomputer. 4,509,120, Cl. 364-200.000.
Daugherty, Norman E.: *See—*
Otto, William C.; and Daugherty, Norman E., 4,509,027, Cl. 335-201.000.
Davis, Aaron J., to Mobil Oil Corporation. Linear prediction coding for compressing of seismic data. 4,509,150, Cl. 367-76.000.
Davis, Ariel R.: *See—*
Clegg, John C.; and Davis, Ariel R., 4,508,996, Cl. 315-224.000.
Davis, John E.; Zielke, Terry L.; and Coash, Ronald J., to Reinke Manufacturing Co., Inc. Corner watering system for center pivot irrigation machines. 4,508,269, Cl. 239-177.200.
Davis, Robert E.; Maio, Patrick S.; and Growney, Lawrence J., to Federal Paper Board Company, Incorporated. Sealed carton with tamper indicating features. 4,508,226, Cl. 206-620.000.
De Dietrich (USA), Inc.: *See—*
Lerman, Michael J.; Koehl, Richard; Chiarella, Anthony A.; and Zamory, William, 4,508,455, Cl. 366-247.000.
De Staat Der Nederlanden, Vertegenwoozdigd doozde Minister van volksgezondheid en Milieuhygiene: *See—*
Van Wezel, Antonius L., 4,508,708, Cl. 424-89.000.
Deans, Harry A.: *See—*
Mut, Alan D.; and Deans, Harry A., 4,508,169, Cl. 166-250.000.
Dearing, Harry L.: *See—*
Walker, Thad O.; Simpson, Jay P.; and Dearing, Harry L., 4,508,628, Cl. 252-8.50P.
DeBarbieri, Augusto; and Bekesi, Julius G., to Proter S.p.A. In vitro and in vivo treatment of cancer cells and treatment of viruses with a tripeptide compound. 4,508,710, Cl. 514-19.000.
DeCristofaro, Nicholas J.: *See—*
Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., 4,508,257, Cl. 228-263.130.
Deere & Company: *See—*
Deutsch, Timothy A.; and Hadley, Howard C., 4,508,243, Cl. 222-142.000.
Drenner, David D., 4,508,071, Cl. 123-198.00A.
Kabele, Dennis F.; and Hauser, Herbert J., Jr., 4,508,019, Cl. 92-158.000.
Wiegardt, Gordon K.; Hanks, Thomas W.; and Murphy, Kenneth E., 4,508,176, Cl. 172-7.000.
Defaucheux, J.: *See—*
Guedj, F.; Defaucheux, J.; and Wiart, A., 4,508,984, Cl. 310-14.000.
DeFrees, Charles W. S., Barbara B. DeFrees, executors: *See—*
DeFrees, Joseph H., deceased, 4,508,131, Cl. 137-43.000.
DeFrees, Joseph H., deceased (by DeFrees, Charles W. S., Barbara B. DeFrees, executors), to Allegheny Valve Company. Safety valving for cargo tanks used for bulk transportation of hazardous commodities. 4,508,131, Cl. 137-43.000.
Degussa Aktiengesellschaft: *See—*
Strempel, Hans-Jurgen; Diehl, Manfred; and Bergmann, Roland, 4,508,633, Cl. 252-135.000.
Dekker, Jan G.: *See—*
van Dijk, Jacob: Renken, Johannes W.; Dekker, Jan G.; and Helmond, Johannes, 4,508,652, Cl. 260-407.000.
Delaney, Dennis D.: *See—*
Fenton, Donald M.; Delaney, Dennis D.; and Bingham, F. Emmett, 4,508,537, Cl. 23-293.00S.
Delmatic Limited: *See—*
Woodnutt, John P., 4,508,997, Cl. 315-360.000.
Delnick, Frank M.; Guidotti, Ronald A.; and McCarthy, David K., to United States of America, Energy. Chromium (V) compounds as cathode material in electrochemical power sources. 4,508,796, Cl. 429-112.000.
DeLoach, Walter W. Closed loop water treating system and method. 4,508,545, Cl. 55-53.000.
Delta Recherche et Developpement: *See—*
Dozier, Jose J., 4,507,929, Cl. 62-79.000.
De Marchi, Franco: *See—*
Tricerri, Silvia Z.; Casagrande, Cesare; De Marchi, Franco; and Nicola, Massimo, 4,508,719, Cl. 514-236.000.
Demmel, Enzio: *See—*
Bohlen, Heinz; and Demmel, Enzio, 4,508,992, Cl. 315-5.390.
Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Nishiwaki, Kenichiro; Sakai, Tomio; and Ohkubo, Takashi, 4,508,885, Cl. 526-318.000.
Dennis, Victor S. Lockable telescopic joint. 4,508,466, Cl. 403-104.000.
Denz, Helmut: *See—*
Becker, Wolfram; and Denz, Helmut, 4,508,082, Cl. 123-478.000.
DePalma, Bernard F.: *See—*
Kavanagh, Frank J.; Plunkett, James D.; and DePalma, Bernard F., 4,507,801, Cl. 2-2.000.
Derouet, Patrick R. J.: *See—*
Cattaneo, Christian J.; Derouet, Patrick R. J.; and Laroche, Michel C. F., 4,508,295, Cl. 244-134.00A.
DeSoto, Inc.: *See—*
Noren, Gerry K.; Poklacki, Erwin S.; Hawker, Fred D.; and Sich, Janice M., 4,508,889, Cl. 528-28.000.
Deutsch, Timothy A.; and Hadley, Howard C., to Deere & Company. Seed meter assembly. 4,508,243, Cl. 222-142.000.
Deutsche Gesellschaft fur Wiederaufarbeitung: *See—*
Janberg, Klaus; and Dyck, Hans-Peter, 4,508,969, Cl. 250-506.100.
Deville, Jean-Pierre, to Seb S.A. Method for enameling the bottom face of a culinary vessel of aluminum or aluminum alloy and a culinary vessel obtained in accordance with said method. 4,508,100, Cl. 126-390.000.
de Witte, Olivier: *See—*
Lacour, Bernard; Maillet, Marc; Vannier, Chantal; and de Witte, Olivier, 4,509,174, Cl. 372-82.000.
Dezern, Morris L. Saw retaining arrangement. 4,507,999, Cl. 83-665.000.
Diaz, Zaida, to Shell Oil Co. Solution removal of HCN from gaseous streams, with pH adjustment of reacted solution and hydrolysis of thiocyanate formed. 4,508,693, Cl. 423-236.000.
Didier-Werke AG: *See—*
Eschmann, Friedrich; Gelsdorf, Gunter; Nold, Peter; Staats, Gotthard; and Subat, Gerhard, 4,508,504, Cl. 432-217.000.
Luhrsen, Ernst; Pohl, Siegfried; and Plath, Jurgen, 4,508,324, Cl. 266-236.000.
Diegelmann, Winfried: *See—*
Bodden, Werner; and Diegelmann, Winfried, 4,508,681, Cl. 419-29.000.
Diehl GmbH & Co.: *See—*
Klober, Martin, 4,508,580, Cl. 149-19.910.
Diehl, Manfred: *See—*
Strempel, Hans-Jurgen; Diehl, Manfred; and Bergmann, Roland, 4,508,633, Cl. 252-135.000.
Diesel Kiki Co., Ltd.: *See—*
Madarame, Michimasa; and Ueda, Kaichi, 4,507,935, Cl. 62-227.000.
Nakamura, Hisashi, 4,508,080, Cl. 123-449.000.
Suzuki, Nobuhiko; Sutoh, Shinji; and Sasaki, Masaya, 4,507,932, Cl. 62-180.000.
Digital Equipment Corporation: *See—*
Lackey, Stanley A.; Meinerth, Kim A.; and Stoner, David A., 4,509,116, Cl. 364-200.000.
Manton, John C.; Okin, Kenneth; and Zacconi, Anthony N., 4,509,115, Cl. 364-200.000.
Dijkmans, Eise C.: *See—*
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DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., to Robotic Vision Systems, Inc. Arrangement for sensing the characteristics of a surface and determining the position of points thereon. 4,508,452, Cl. 356-375.000.

Dinger, Rudolf, to Asulab S.A. Pressure sensitive element and a sensor comprising such an element. 4,507,970, Cl. 73-702.000.

Display Components, Inc.: *See—*
Sawyer, Carleton E.; and Masterman, Hugh C., 4,508,989, Cl. 310-184.000.

Disston, Horace C.: *See—*
Eichfeld, Timothy J.; and Disston, Horace C., 4,508,274, Cl. 239-455.000.

Ditcher, John, to A-Lok Products Corporation. Gasket suitable for use in sealing exterior of sewer pipe to opening in manhole, and method and system employing same. 4,508,355, Cl. 277-189.000.

Ditton, Elaine A.: *See—*
Meyer, Steven M.; Kuna, Wayne A.; Morrison, Robert S.; Morrison, Howard J.; Ditton, Richard A.; and Ditton, Elaine A., 4,508,353, Cl. 273-313.000.

Ditton, Richard A.: *See—*
Meyer, Steven M.; Kuna, Wayne A.; Morrison, Robert S.; Morrison, Howard J.; Ditton, Richard A.; and Ditton, Elaine A., 4,508,353, Cl. 273-313.000.

Diversified Products Corporation: *See—*
Kelley, Robert C.; and Silberman, Ira J., 4,508,335, Cl. 272-145.000.

Dixon, Robert H.: *See—*
Elton, Raymond C.; Dixon, Robert H.; and Ford, James L., 4,508,055, Cl. 118-724.000.

Dixon, Robert W., to Chas. M. Bailey Co., Inc. Polyjet valve with backwash. 4,508,138, Cl. 137-239.000.

Dixon, Samuel, Jr.: *See—*
Jacobs, Harold; Dixon, Samuel, Jr.; and Malecki, Edmund E., 4,509,009, Cl. 324-95.000.

Djordjevic, Borislav B.; and Traugott, Stephen C., to Martin Marietta Corporation. Ultrasonic liquid jet probe. 4,507,969, Cl. 73-644.000.

Dobler, Helmut; Zeller, Rolf; and Seitz, Helmut, to Daimler-Benz Aktiengesellschaft. Internal combustion engine balance shaft bearing arrangement at the crankcase. 4,508,069, Cl. 123-192.00B.

Doboy Packaging Machinery, Inc.: *See—*
Meyer, James A., 4,507,906, Cl. 53-371.000.

Doc-K Protective Equipment, Inc.: *See—*
Kavanagh, Frank J.; Plunkett, James D.; and DePalma, Bernard F., 4,507,801, Cl. 2-2.000.

Dr. Ing. h.c.F. Porsche A.G.: *See—*
Hofbauer, August; and Beer, Michael, 4,508,073, Cl. 123-307.000.

Doery, Michael S., to Xerox Corporation. Alternative feeding document recirculation. 4,508,447, Cl. 355-14.0SH.

Doi, Motomichi; Okano, Kinpei; Nii, Katsutoshi; and Yokota, Yoshiharu, to Hitachi, Ltd. Method of producing bearing component. 4,508,396, Cl. 384-463.000.

Dolhyj, Serge R.; and Enyedy, Roseann M., to Standard Oil Company, The. Catalysts and process of making. 4,508,848, Cl. 502-239.000.

Doll, Brian E.; and Smyth, Patrick G. Control of cyanides in FCC reactor by injection of ammonium polysulfide. 4,508,683, Cl. 422-7.000.

Don Marketing Ltd.: *See—*
Donovan, John, 4,508,513, Cl. 434-346.000.

Donner, Bernd; and Siefert, Roland, to Kienzle Apparate GmbH. Tachograph cover door assembly. 4,507,963, Cl. 73-431.000.

Donovan, John, to Don Marketing Ltd. Game card device. 4,508,513, Cl. 434-346.000.

Dorler, Jack A.; Mosley, Joseph M.; and Weitzel, Stephen D., to International Business Machines Corporation. Driver circuitry for reducing on-chip Delta-I noise. 4,508,981, Cl. 307-542.000.

Dorrian, Philip J.: *See—*
Livorsi, Carl F.; Wucik, Joseph A., Jr.; Dorrian, Philip J.; and Struzik, Lawrence F., 4,508,315, Cl. 251-173.000.

Douillard, Alain: *See—*
Camps, Marcel; Douillard, Alain; Dubois, Jean-Claude; Gazard, Maryse; Montheard, Jean-Pierre; Pascal, Thierry; and Seytre, Gerard, 4,508,639, Cl. 252-500.000.

Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V.: *See—*
Thijssen, Henricus A. C.; and van der Malen, Bernardus G. M., 4,508,553, Cl. 62-541.000.

Dow Chemical Company, The: *See—*
Keskey, William H.; Schuetz, James E.; and Lee, Do I., 4,508,869, Cl. 524-808.000.
Keskkula, Henno; McCreedy, Kathleen M.; and Maass, Donald A., 4,508,871, Cl. 525-78.000.
Leathers, Joel F. M.; and Calvin, Donald W., 4,508,538, Cl. 23-313.00R.
Simon, Jaime; Wilson, David A.; and Volkert, Wynn A., 4,508,704, Cl. 424-14.000.

Dow Corning Corporation: *See—*
Kohl, Charles F., 4,508,887, Cl. 528-21.000.

Dowdle, Dean M., to Minnesota Mining and Manufacturing Company. Shielded, closely spaced transmit-receiver antennas for electronic article surveillance system. 4,509,039, Cl. 340-572.000.

Dowling, Edward C.; and Fortuna, Jon A., to AMP Incorporated. Polarized ribbon cable connector having circuit components therein. 4,508,399, Cl. 339-17.0CF.

Downey, Claudine K.: *See—*
Downey, Robert E.; and Downey, Claudine K., 4,508,044, Cl. 112-262.200.

Downey, Robert E.; and Downey, Claudine K. Rebuilt pillow and method of manufacturing the same. 4,508,044, Cl. 112-262.200.

Doyle, Gerald; Pruett, Roy L.; and Savage, David W., to Exxon Research & Engineering Co. Separation and recovery of carbon monoxide by copper (I) complexes. 4,508,694, Cl. 423-246.000.

Dozier, Jose J., to Delta Recherche et Developpement. Method and installation for monitoring the temperature in a greenhouse. 4,507,929, Cl. 62-79.000.

Dragerwerk AG: *See—*
Warncke, Ernst, 4,508,115, Cl. 128-201.230.

Drake, Robert C. Golf putter. 4,508,342, Cl. 273-80.00C.

Drenner, David D., to Deere & Company. Canister retainer assembly. 4,508,071, Cl. 123-198.00A.

Dresser Industries, Inc.: *See—*
Montgomery, Marshall N.; and Michaels, John M., 4,507,957, Cl. 73-151.000.
Read, Norman W., 4,508,173, Cl. 166-330.000.

Drews, Robert C.; Meyer, Danny D.; Shalon, Tadmor; and Pasternak, Eliezer, to Ninetronix, Inc. Ophthalmic aspirator/irrigator and cystotome. 4,508,532, Cl. 604-22.000.

Dromard, Adrien; and Millet, Claude, to Rhone-Poulenc Specialites Chimiques. Catalytic preparation of high molecular weight polysiloxanes. 4,508,845, Cl. 502-159.000.

Dronieter, Klaus, to Daimler-Benz Aktiengesellschaft. Brake-force control for at least one axle of a vehicle equipped with an anti-locking system. 4,508,393, Cl. 303-111.000.

Drumco: *See—*
Drummond, Donald D.; Johnsey, Walter F.; and Wood, Roy W., 4,508,183, Cl. 175-69.000.

Drummond, Donald D.; Johnsey, Walter F.; and Wood, Roy W., to Drumco. Method and apparatus for lubricating a drill bit. 4,508,183, Cl. 175-69.000.

Dubois, Jean; Lacroix, Alain; Forestier, Lucienne; and Steiner, Jean-Pierre, to Lesieur-Cotelle. Dispenser for a toilet. 4,507,812, Cl. 4-228.000.

Dubois, Jean-Claude: *See—*
Camps, Marcel; Douillard, Alain; Dubois, Jean-Claude; Gazard, Maryse; Montheard, Jean-Pierre; Pascal, Thierry; and Seytre, Gerard, 4,508,639, Cl. 252-500.000.

Duchon, Paul A. Jr.: *See—*
Mouilhayrat, Guy G.; Duchon, Paul A. J.; Guilbert, Jean M. A. M.; and Rolfo, Andre A., 4,508,297, Cl. 244-173.000.

Duclos, Clovis R. Golf club head. 4,508,350, Cl. 273-183.00D.

Ductmate Industries, Inc.: *See—*
Arnoldt, Peter J., 4,508,376, Cl. 285-363.000.

Duffers Scientific, Inc.: *See—*
Ferguson, Hugo S., 4,509,000, Cl. 318-591.000.

Dufour, Daniel L.; and Jones, William J., to Monsanto Company. Polyblends of thermoplastic copolyetheresters and acrylonitrile-butadiene-styrene polymers. 4,508,870, Cl. 525-64.000.

Duke, George B. Garden and lawn tractor. 4,508,188, Cl. 180-210.000.

Dumortier, Robert. Manhole with articulated cover members. 4,508,469, Cl. 404-25.000.

Duncan, David T.; Lipscomb, David M.; McElligott, John; and Williams, Charles W., to Products for Health and Industry. Carbon dioxide rebreathing apparatus. 4,508,116, Cl. 128-203.280.

Duncan, George A., to University of Kentucky Research Foundation. Method and apparatus for harvesting tobacco. 4,508,482, Cl. 414-26.000.

Dungs, Horst: *See—*
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, 4,508,596, Cl. 202-227.000.

Dunham-Bush, Inc.: *See—*
Schaefer, Donald D., 4,508,491, Cl. 417-310.000.

Du Pont de Nemours, E. I., and Company: *See—*
Burrus, Harry O., 4,508,697, Cl. 423-499.000.
Heiart, Robert B.; and Cohen, Abraham B., 4,508,802, Cl. 430-22.000.
Sieja, James B., 4,508,660, Cl. 260-465.400.
Webster, Owen W., 4,508,880, Cl. 526-190.000.
Zeldes, Michael D., 4,508,764, Cl. 427-296.000.

Duracell Inc.: *See—*
Gopikanth, Mysore L.; Kuo, Han C.; and Bowden, William L., 4,508,798, Cl. 429-196.000.
Gopikanth, Mysore L.; and Kuo, Han C., 4,508,799, Cl. 429-196.000.
Gopikanth, Mysore L.; Kuo, Han C.; and Schlaikjer, Carl R., 4,508,800, Cl. 429-196.000.

Dutcher, Daniel P., to Champion International Corporation. 3-D Glasses and method for producing same. 4,508,526, Cl. 493-346.000.

Duvdevani, Ilan: *See—*
Kowalik, Ralph M.; Duvdevani, Ilan; Peiffer, Dennis G.; and Lundberg, Robert D., 4,508,128, Cl. 137-13.000.

Duwel, Edward C.: *See—*
Sederberg, John H.; and Duwel, Edward C., 4,509,141, Cl. 364-900.000.

Dvortsak, Peter: *See—*
Huhn, Magda; Szabo, Gabor; Dvortsak, Peter; Karpati, Marianna; and Somfai, Eva, 4,508,658, Cl. 260-465.00D.

DX Antenna Company, Limited: *See—*
Nagatomi, Akihiko, 4,509,198, Cl. 455-4.000.

Dyck, Hans-Peter: *See—*
Janberg, Klaus; and Dyck, Hans-Peter, 4,508,969, Cl. 250-506.100.

Dynamit Nobel AG: *See—*
Schmidt, Hans-Georg, 4,508,914, Cl. 549-323.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Jensen, Ernst; Knappworst, Jurgen; and Stahlmann, Rudolf, 4,508,036, Cl. 102-444.000.

Dynasplint Systems, Inc.: *See—*
Hepburn, George R., 4,508,111, Cl. 128-87.00R.

E.C.H. Will (GmbH & Co.): *See*—
Ramcke, Bernd; and Stahl, Gunther. 4,508,210, Cl. 198-627.000.
E. L. Mustee & Sons, Inc.: *See*—
Mustee, Robert J., 4,508,304, Cl. 248-311.200.
E.M.B. Corporation: *See*—
Otto, William C.; and Daugherty, Norman E., 4,509,027, Cl. 335-201.000.
E-Systems, Inc.: *See*—
Andren, Carl F.; Mosley, William H., Jr.; and Sanders, David E., 4,509,017, Cl. 329-105.000.
E-Z Buck, Inc.: *See*—
Freewalt, Wayne L.; and Ziegler, Joseph L., 4,508,194, Cl. 182-153.000.
Eaton Corporation: *See*—
Bernett, Thomas B., 4,508,144, Cl. 138-45.000.
Goscenski, Edward J., Jr., 4,507,984, Cl. 74-650.000.
Hemme, Wilbur F., 4,508,314, Cl. 251-11.000.
Kelly, William W.; and Bradshaw, Cyril E., 4,508,134, Cl. 137-103.000.
Oehlke, Donald N.; MacRae, Ralph A.; Crammond, James; and Rattmann, Hans R., 4,508,477, Cl. 411-174.000.
Schlesinger, Lawrence; German, Dale F.; and Richards, Donald L., 4,507,956, Cl. 73-146.500.
Eberle, Reinhard: *See*—
Heber, Helmut; Eberle, Reinhard; and Teetz, Volker, 4,508,644, Cl. 260-112.50R.
Eburn, William H., Jr.; and Kalenik, Stephen P., to Polaroid Corporation. Zero displacement low-shear valve. 4,508,142, Cl. 137-625.400.
Edilvelox S.R.L.: *See*—
Rossin, Ineo; and Zanella, Francesco, 4,508,308, Cl. 249-19.000.
Edinger, J. Raymond: *See*—
Alexandrovich, George; Edinger, J. Raymond; Hofer, Alan; and Kuykendall, John, 4,509,159, Cl. 369-170.000.
Edison International Inc.: *See*—
Livorsi, Carl F.; Wucik, Joseph A., Jr.; Dorrian, Philip J.; and Struzik, Lawrence F., 4,508,315, Cl. 251-173.000.
Edmiston, James H.: *See*—
Lambert, Johnny H.; Primat, Didier; Edmiston, William H.; Edmiston, Johnny J.; and Edmiston, James H., 4,507,998, Cl. 83-419.000.
Edmiston, Johnny J.: *See*—
Lambert, Johnny H.; Primat, Didier; Edmiston, William H.; Edmiston, Johnny J.; and Edmiston, James H., 4,507,998, Cl. 83-419.000.
Edmiston, William H.: *See*—
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EECO Incorporated: *See*—
Robinson, Ronnie D., 4,509,097, Cl. 361-395.000.
Eggers, Fred S. Disc drive assembly. 4,509,160, Cl. 369-269.000.
Ehling, Uwe: *See*—
Hirsch, Werner; and Ehling, Uwe, 4,507,875, Cl. 34-44.000.
Eichfeld, Timothy J.; and Disston, Horace C. Adjustable flow coolant nozzle. 4,508,274, Cl. 239-455.000.
Eiting, John R., to Precision Strip, Inc. Scroll slitting and rewind apparatus. 4,508,282, Cl. 242-56.200.
Eke, Kenneth I., to Microwave Owens Limited. Microwave ovens and methods of cooking foods. 4,508,947, Cl. 219-10.55B.
El Paso Products Company: *See*—
Olah, George A., 4,508,618, Cl. 208-134.000.
Elco Corporation, The: *See*—
Litt, Frederic A.; and Czernicki, Thomas R., 4,508,630, Cl. 252-32.500.
Elepano, Normita P.; Schnur, William H.; and Jorgensen, Jens L., to Minnesota Mining and Manufacturing Company. Aqueous skin cleaner composition comprising propylene carbonate. 4,508,634, Cl. 252-163.000.
Elhaus, Friedrich W. Conveying means for extrusion profiles. 4,507,950, Cl. 72-257.000.
Eli Lilly and Company: *See*—
Lacefield, William B.; and Lindstrom, Terry D., 4,508,735, Cl. 514-616.000.
Miesel, John L., 4,508,722, Cl. 514-353.000.
Mynderse, Jon S.; and O'Connor, Sean C., 4,508,901, Cl. 546-112.000.
Elliott, Alwyn, to Moler Products Limited. Manufacture of highly porous refractory material. 4,508,667, Cl. 264-13.000.
Elmis, Herbert; and Klar, Adrian, to ITT Industries, Inc. Digital circuit for providing a binary signal on the occurrence of a predetermined frequency ratio of two signals. 4,509,072, Cl. 358-17.000.
Elspass, Marold, to Rheinmetall GmbH. Locking arrangement for the elevating mechanism of a gun barrel. 4,508,007, Cl. 89-37.110.
Elting, James J.: *See*—
Lindall, Arnold W.; and Elting, James J., 4,508,828, Cl. 436-500.000.
Elton, Raymond C.; Dixon, Robert H.; and Ford, James L., to United States of America, Navy. Device for cryogenically fabricating source material for plasma X-ray lasers. 4,508,055, Cl. 118-724.000.
Embree, David M.: *See*—
Burger, William A.; Embree, David M.; Singer, Martin H.; and Vogelpohl, David R., 4,508,937, Cl. 179-84.00T.
Emergency Power Engineering, Inc.: *See*—
Henderson, Lawrence E., 4,508,974, Cl. 307-66.000.
Emerson Electric Co.: *See*—
Tuggle, Lloyd H.; and Ferlito, Michael J., 4,508,068, Cl. 123-187.50R.
Emhart Industries, Inc.: *See*—
Fenton, Frank A., 4,508,557, Cl. 65-348.000.
Emi, Toshihiko: *See*—
Nakato, Hakaru; Sakuraya, Toshikazu; Habu, Yasuhiro; Emi, Toshihiko; Kodama, Masanori; Koshikawa, Takao; Yoshida, Yoshimitsu; and Shimokawa, Fumitaka, 4,508,571, Cl. 106-38.280.
Energy Adaptive Grinding, Inc.: *See*—
Smith, Roderick L., 4,507,896, Cl. 51-165.920.
English, George J., to GTE Products Corporation. Single-ended metal halide discharge lamp arc gap fabricating process. 4,508,514, Cl. 445-26.000.
Enyedy, Roseann M.: *See*—
Dolhyj, Serge R.; and Enyedy, Roseann M., 4,508,848, Cl. 502-239.000.
Epic Metals Corporation: *See*—
Landis, Donald H., 4,507,900, Cl. 52-221.000.
Epstein, James; and Marincic, Nikola, to Battery Engineering Inc. Electrochemical cell. 4,507,857, Cl. 29-623.200.
Erel, David. Apparatus for use as physical exerciser and means of locomotion. 4,508,358, Cl. 280-234.000.
Erhardt, Paul W.: *See*—
Matier, William L.; Erhardt, Paul W.; and Patil, Ghanshyam, 4,508,725, Cl. 514-362.000.
Ericsson, Inc.: *See*—
Harris, Robert N.; and McGuire, Michael E., 4,508,278, Cl. 242-1.000.
Eriksson, Richard C., to XIS, Incorporated. Vacuum deposition apparatus for manufacturing selenium photoreceptors. 4,508,053, Cl. 118-712.000.
Eriksson, Richard C., to XIS, Incorporated. Manufacturing process for selenium photoreceptors. 4,508,748, Cl. 427-8.000.
Eriksson, Sune; Santen, Sven; and Bjorling, Gotthard, to SKF Steel Engineering Aktiebolag. Method of cleaning a gas flow containing zinc vapor. 4,508,566, Cl. 75-88.000.
Erlam, David P., to Rittal-CSM Limited. Card frames. 4,508,228, Cl. 211-41.000.
Ersoy, Metin, to Maschinenfabrik HILMA GmbH. Swing clamp. 4,508,327, Cl. 269-23.000.
Erzinger, Paul; and Lapple, Arnulf R., to Ciba-Geigy Corporation. Solid dye mixtures for dyeing polyacrylonitrile navy blue to black. 4,508,536, Cl. 8-639.000.
Escaron, Jean: *See*—
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Eschem Inc.: *See*—
Maxwell, Gary A., 4,508,773, Cl. 428-198.000.
Eschmann, Friedrich; Gelsdorf, Gunter; Nold, Peter; Staats, Gotthard; and Subat, Gerhard, to Didier-Werke AG. Blast heating apparatus for blast furnaces. 4,508,504, Cl. 432-217.000.
Essinger, Walter F., to Sigmatron Associates. Thin-film EL panel mounting unit. 4,508,990, Cl. 313-50.000.
Etablissements Montabert: *See*—
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Etherton, Bradley P.; and Hamer, Anthony D., to Exxon Research & Engineering Co. Supported polyolefin catalyst for the polymerization of ethylene under high temperatures. 4,508,843, Cl. 502-115.000.
Ethyl Corporation: *See*—
Perilstein, Warren L., 4,508,540, Cl. 44-53.000.
Evans, John M.: *See*—
Wittmann, Joseph W.; and Evans, John M., 4,508,884, Cl. 526-279.000.
Evans, Rowland M., to Allied Corporation. Stall detector and surge prevention feature for a gas turbine engine. 4,507,915, Cl. 60-39.281.
Everard, Lloyd D., to Valley Industries, Inc. Retractable awning for mobile dwellings. 4,508,126, Cl. 135-89.000.
Ex-Cell-O Corporation: *See*—
Kalokhe, Shivdas A., 4,508,476, Cl. 408-156.000.
Exevea, Amador G. Toy camera that produces simulated photo. 4,508,518, Cl. 446-475.000.
Exxon Production Research Co.: *See*—
Mut, Alan D.; and Deans, Harry A., 4,508,169, Cl. 166-250.000.
Exxon Research & Engineering Co.: *See*—
Agapiou, Agapios K., 4,508,844, Cl. 502-132.000.
Chianelli, Russell R.; and Pecoraro, Theresa A., 4,508,847, Cl. 502-200.000.
Doyle, Gerald; Pruett, Roy L.; and Savage, David W., 4,508,694, Cl. 423-246.000.
Etherton, Bradley P.; and Hamer, Anthony D., 4,508,843, Cl. 502-115.000.
Fuller, Everett J.; and Lundberg, Robert D., 4,508,626, Cl. 210-708.000.
Howkins, Stuart D., 4,509,059, Cl. 346-1.100.
Kowalik, Ralph M.; Duvdevani, Ilan; Peiffer, Dennis G.; and Lundberg, Robert D., 4,508,128, Cl. 137-13.000.
Kowalski, Ronald C., 4,508,592, Cl. 159-2.100.
Moss, Gerald, 4,508,544, Cl. 48-197.00R.
Moustakas, Theodore D.; and Maruska, H. Paul, 4,508,609, Cl. 204-192.00S.
Muhle, Mike E.; Stolz, Richard J.; and Wright, Cecil W., 4,508,859, Cl. 523-346.000.
Peoples, Clarence, Jr.; Puydak, Robert C.; and Jansen, Deborah S., 4,508,771, Cl. 428-95.000.
Savage, David W.; and Sartori, Guido, 4,508,692, Cl. 423-228.000.

Ezis, Andre, to Ford Motor Company. Method of making an anisotropic silicon nitride comprising object by use of higher density and fully reacted preforms. 4,508,671, Cl. 264-58.000.
Ezra C. Lundahl, Inc.: *See—*
Thornley, W. Ray; Wiser, James G.; and Lundahl, E. Cordell, 4,507,910, Cl. 56-10.200.
Fabel, Ludwig: *See—*
Bachmann, Erich; Fabel, Ludwig; Fischer, Roland; Peter, Werner; Scheiter, Bernd; and Wenzel, Werner, 4,508,494, Cl. 418-13.000.
Fabricius, Karen A.; and Kemlage, Bernard M., to International Business Machines Corporation. Method of manufacturing a minimum bird's beak recessed oxide isolation structure. 4,508,757, Cl. 427-93.000.
Facet Enterprises, Incorporated: *See—*
Packard, Gary R.; and Mower, Michael L., 4,508,203, Cl. 192-84.00C.
Facoetti, Hugues: *See—*
Broussoux, Dominique; Facoetti, Hugues; and Micheron, Francois, 4,508,668, Cl. 264-22.000.
FAG Kugelfischer Georg Schafer Kommanditgesellschaft auf Aktien: *See—*
Hofmann, Heinrich; and Treutlein, Dieter, 4,508,397, Cl. 384-510.000.
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Fainzilberg, Zeilik: *See—*
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Fairbairn, Leroy W.; and Waldron, Clifford R., to Allied Corporation. Apparatus for making an electrical contact. 4,507,858, Cl. 29-747.000.
Fairchild Camera & Instrument Corporation: *See—*
Smith, Peter R., 4,507,848, Cl. 29-576.00B.
Farge, Daniel: *See—*
Berger, Christian; Farge, Daniel; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,508,717, Cl. 514-203.000.
Farmitalia Carlo Erba: *See—*
Alpegiani, Marco; Battistini, Carlo; Bedeschi, Angelo; Franceschi, Giovanni; Foglio, Maurizio; and Zarini, Franco, 4,508,649, Cl. 260-245.20R.
Farver, Terry F.: *See—*
Kim, Chong Y.; Farver, Terry F.; and Brewer, Jack W., 4,508,825, Cl. 435-201.000.
Fassett, Matthew, to Raytheon Company. Blockage-free space fed antenna. 4,509,055, Cl. 343-754.000.
Fattic, Gerald T.; and Vukovich, William J., to General Motors Corporation. Continuously variable transmission ratio control system. 4,509,125, Cl. 364-424.100.
Faust-Fertigungstechnik GmbH & Co. KG: *See—*
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Favre, Roger: *See—*
Letoffe, Michel; Favre, Roger; and Perrin, Patrice, 4,508,888, Cl. 528-23.000.
FBC Limited: *See—*
Rowson, Graham P.; Percival, Albert; and Judson, Philip N., 4,508,659, Cl. 260-465.00D.
Federal Paper Board Company, Incorporated: *See—*
Davis, Robert E.; Maio, Patrick S.; and Growney, Lawrence J., 4,508,226, Cl. 206-620.000.
Feigt, Ingmar: *See—*
Oberschmid, Raimund; and Feigt, Ingmar, 4,508,966, Cl. 250-327.200.
Fekete, Gyorgy: *See—*
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Feldkamper, Richard, to Windmoller & Holscher. Apparatus for folding paper sacks to Z shape. 4,508,529, Cl. 493-438.000.
Feldman, Karl T., Jr., to Gould Inc. High-current sweep cable. 4,508,934, Cl. 174-101.500.
Fenton, Donald M.; Delaney, Dennis D.; and Bingham, F. Emmett, to Union Oil Company of California. Method for removing elemental sulfur particles from the aqueous washing solution of a hydrogen sulfide removal process. 4,508,537, Cl. 23-293.00S.
Fenton, Frank A., to Emhart Industries, Inc. Dead plate arrangement of a glassware forming machine. 4,508,557, Cl. 65-348.000.
Ferag Ag: *See—*
Leu, Willy, 4,508,523, Cl. 474-115.000.
Ferguson, Hugo S., to Duffers Scientific, Inc. Bumpless feedback switching apparatus for use in a servo system. 4,509,000, Cl. 318-591.000.
Ferlito, Michael J.: *See—*
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Ferns, Derek, to Selflevel Covers (Jersey) Limited. Manhole/access cover and frame assemblies. 4,508,470, Cl. 404-25.000.
Ferrara, Joseph J.: *See—*
Hubler, Lawrence C.; Ferrara, Joseph J.; Albright, Roger N.; and Bassett, Raymond C., 4,508,329, Cl. 270-53.000.
Ferrari, Luigi M. Container display package. 4,508,225, Cl. 206-461.000.
Fey, Maurice G., to Westinghouse Electric Corp. Electric arc-fired blast furnace system. 4,509,177, Cl. 373-60.000.
Fiatallis Europe, S.p.A.: *See—*
Barbagli, Rino O., 4,508,013, Cl. 91-516.000.
Ficho, William: *See—*
Banks, Julia G.; and Ficho, William, 4,508,156, Cl. 164-35.000.
Fichtel & Sachs AG: *See—*
Axthammer, Ludwig; and Wossner, Felix, 4,508,201, Cl. 188-322.190.
Fidi, Werner; Pribyl, Richard; and Wolf, Konrad, to AKG Akustische u.Kino-gerate gesellschaft mbH. Microphone diaphragm. 4,508,192, Cl. 181-158.000.
Fields, Ellis K.: *See—*
Nimry, Tayseer S.; and Fields, Ellis K., 4,508,605, Cl. 204-158.00R.
Figgie International Inc.: *See—*
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Filges, Ralf: *See—*
Ramesohl, Hubert; Seelen, Fritz; Filges, Ralf; Schroder, Karlheinz; and Veiser, Elmar, 4,508,503, Cl. 432-109.000.
Fink, Friedrich: *See—*
Lades, Hans; Fink, Friedrich; Liebel, Siegfried; Lauterbach, Inge; Taube, Thomas; and Zollner, Dieter, 4,509,178, Cl. 373-93.000.
Fink, Hans, to Bata Schuh AG. Process for joining polyurethane coated fabrics. 4,508,582, Cl. 156-93.000.
Finkelstein, Manuel; and Ross, Sidney D., to Sprague Electric Company. Electrolytic capacitor for at least 150 V service. 4,509,094, Cl. 361-314.000.
Finkelstein, Wolfgang; and Riegel, Hans, to Gebrueder Trox GmbH. Ceiling air outlet. 4,508,022, Cl. 98-40.120.
Firestone Tire & Rubber Company, The: *See—*
Hergenrother, William L.; Matlock, Mark G.; and Ambrose, Richard J., 4,508,874, Cl. 525-285.000.
Firey, Joseph C. Crossed pulse liquid atomizer. 4,508,273, Cl. 239-427.000.
Fischbeck, Kenneth H., to Xerox Corporation. Ink jet printing using horizontal interlacing. 4,509,058, Cl. 346-1.100.
Fischer, Hanspeter: *See—*
Riebli, Peter; Fischer, Hanspeter; Thummel, Rudolph C.; and Hubele, Adolf, 4,508,731, Cl. 514-472.000.
Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Traveling paper web capturing apparatus for use with a rotary printing machine. 4,508,033, Cl. 101-217.000.
Fischer, Roland: *See—*
Bachmann, Erich; Fabel, Ludwig; Fischer, Roland; Peter, Werner; Scheiter, Bernd; and Wenzel, Werner, 4,508,494, Cl. 418-13.000.
Fitzgerald, Marilyn. Game with individual two part boards. 4,508,351, Cl. 273-248.000.
Fleming, Georges, to ARBED S.A. Runner for molten metal. 4,508,323, Cl. 266-191.000.
Fleming, Robert J.: *See—*
Reintjes, Anthony B.; Fleming, Robert J.; and Gumb, Bev W. T., 4,508,755, Cl. 427-58.000.
Fletcher, Ian J.: *See—*
Bedekovic, Davor; and Fletcher, Ian J., 4,508,897, Cl. 544-127.000.
Flood, Paul W.: *See—*
Salatiello, Peter P.; Petrucelli, Frank; and Flood, Paul W., 4,508,675, Cl. 264-310.000.
Focke & Co.: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,508,218, Cl. 206-271.000.
Focke, Heinz; and Liedtke, Kurt, to Focke & Pfuhl. Packing cigarettes. 4,507,903, Cl. 53-151.000.
Focke, Heinz; and Liedtke, Kurt, to Focke & Co. Soft cigarette pack. 4,508,218, Cl. 206-271.000.
Focke & Pfuhl: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,507,903, Cl. 53-151.000.
Fogassy, Elemer; Toke, Laszlo ; Faigl, Ferenc; Soos, Rudolf; Bozzay, Jozsef; Kolta, Rezso; Nemes, Jozsef; and Bencsik, Peter, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Process for the preparation of optically active cyclopropane carboxylic acids. 4,508,919, Cl. 562-401.000.
Foglio, Maurizio: *See—*
Alpegiani, Marco; Battistini, Carlo; Bedeschi, Angelo; Franceschi, Giovanni; Foglio, Maurizio; and Zarini, Franco, 4,508,649, Cl. 260-245.20R.
Fokker BV: *See—*
Schliekelmann, Robert J., 4,507,967, Cl. 73-621.000.
Foll, Eberhard; Holl, Peter; and Vetter, Helmut, to 501 Polymer-Physik GmbH & Co. Process for crosslinking lacquers which are based on plastics and have been applied to base materials. 4,508,750, Cl. 427-44.000.
Foncages et Forages Bessac, S.A.: *See—*
Bessac, Michel, 4,508,390, Cl. 299-33.000.
Foor, Forrest; and Roberts, Gary P., to Merck & Co., Inc. Bacteriophage DNA cloning vector TG1 and microorganisms containing TG1. 4,508,826, Cl. 435-235.000.
Forbes, Ervin: *See—*
Rey, Thomas J.; and Forbes, Ervin, 4,509,121, Cl. 364-200.000.
Ford, James L.: *See—*
Elton, Raymond C.; Dixon, Robert H.; and Ford, James L., 4,508,055, Cl. 118-724.000.
Ford Motor Company: *See—*
Adams, Karen M.; and Gandhi, Haren S., 4,508,691, Cl. 423-213.500.
Ezis, Andre, 4,508,671, Cl. 264-58.000.
Hartsock, Dale L., 4,508,066, Cl. 123-41.710.
Hayosh, Robert J.; Lewis, Robert H.; and Simon, Frederick A., 4,508,280, Cl. 242-191.000.
Holubka, Joseph W., 4,508,879, Cl. 525-528.000.
Huff, John; Wiggle, Ronald R.; and Hospadaruk, Vladimir, 4,508,684, Cl. 422-8.000.
Turner, Robert; and Seabrook, Robert A., 4,507,982, Cl. 74-493.000.

Forest, Joseph G.; and Czarnetzky, Edward J., to International Stock Food Corporation. Method for preserving silage and related compositions. 4,508,737, Cl. 426-54.000.
Forestier, Lucienne: *See*—
Dubois, Jean; Lacroix, Alain; Forestier, Lucienne; and Steiner, Jean-Pierre, 4,507,812, Cl. 4-228.000.
Forrest, William E., to Charles I. Brown, a part interest. Friction-type descent control device. 4,508,193, Cl. 182-5.000.
Fortuna, Jon A.: *See*—
Dowling, Edward C.; and Fortuna, Jon A., 4,508,399, Cl. 339-17.0CF.
Fossa, Guiseppe. Device for retrieval of golf balls. 4,507,881, Cl. 36-132.000.
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Frito-Lay, Inc.: *See*—
Ryan, Philip J., 4,508,739, Cl. 426-144.000.
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Sitterle, George, 4,508,436, Cl. 351-160.00H.
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Asao, Yasuzi; and Fuchizawa, Tetsuro, 4,508,804, Cl. 430-62.000.
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Uchiyama, Shintaro, 4,508,190, Cl. 180-247.000.
Fuji Kogyo Co., Ltd.: *See*—
Ohmura, Ryuichi, 4,507,891, Cl. 43-24.000.
Fuji Photo Film Co., Ltd.: *See*—
Asao, Yasuzi; and Fuchizawa, Tetsuro, 4,508,804, Cl. 430-62.000.
Kanaoka, Takeshi; and Shimizu, Shigehisa, 4,508,438, Cl. 354-105.000.
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,508,805, Cl. 430-72.000.
Ochiai, Takeji, 4,508,636, Cl. 252-301.360.
Ogawa, Masashi; Ishigaki, Kunio; Iwasaki, Nobuyuki; and Nakamura, Taku, 4,508,818, Cl. 430-523.000.
Ohno, Shigeru; and Kishimoto, Shinzo, 4,508,817, Cl. 430-393.000.
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Izumi, Hirotaka, 4,508,445, Cl. 355-3.0SH.
Fujii, Tadashi; Yamaguchi, Tomoyuki; Murakami, Kakuji; Kawakami, Tomiko; and Uenozono, Hiroko, to Ricoh Company, Ltd. Aqueous ink for ink-jet printing. 4,508,570, Cl. 106-20.000.
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Kashiwagi, Atumi, 4,508,331, Cl. 271-107.000.
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Fujimura, Yasushi; Okada, Takashi; Tanaka, Yutaka; and Ikeda, Yasunari, to Sony Corporation. Double-scanning non-interlace television receiver. 4,509,071, Cl. 358-11.000.
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Furumura, Yuji, 4,509,070, Cl. 357-41.000.
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Sogo, Hiroyuki; Ohsawa, Zenichi; Umino, Isamu; and Nishida, Haruki, 4,509,208, Cl. 455-317.000.
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Fuller, Everett J.; and Lundberg, Robert D., to Exxon Research & Engineering Co. Oil removal from water suspensions using ionic domain polymers. 4,508,626, Cl. 210-708.000.
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Funahashi, Takuo: *See*—
Koyama, Toshihiro; Anbe, Yoshiharu; and Funahashi, Takuo, 4,507,946, Cl. 72-17.000.
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Sato, Mineo; Kawaguchi, Tadaaki; Okawachi, Yukinori; and Funahashi, Yasuyuki, 4,507,940, Cl. 62-407.000.
Funk, Erwin D.: *See*—
Richter, Ole J.; and Funk, Erwin D., 4,508,473, Cl. 406-64.000.
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Furumura, Yuji, to Fujitsu Limited. Metal-insulator-semiconductor transistor device. 4,509,070, Cl. 357-41.000.
Furutsu, Akira, to Japan Bano'k Co., Ltd.; and Ben Clements & Sons, Inc. Bundling belt device. 4,507,828, Cl. 24-16.0PB.
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Hara, Yasuhiko; Akiyama, Nobuyuki; Fushimi, Satoru; Oshima, Yoshimasa; and Aoki, Nobuhiko, 4,508,453, Cl. 356-394.000.
G. D. Societa per Azione: *See*—
Seragnoli, Enzo, 4,507,908, Cl. 53-498.000.
Gadgill, Balkrishna B.: *See*—
Obrist, Albert; and Gadgill, Balkrishna B., 4,508,690, Cl. 423-173.000.
Gagne, Donald J., to Control Data Corporation. Releasable position-locking connector assembly. 4,508,418, Cl. 339-253.00R.
Gajecki, Rickard, to AOs Metall & Mek. Verkstad AB. Method of eliminating discomforting flickering when viewing X-ray film in a light cabinet, and a flicker-eliminating unit for use in a light cabinet. 4,508,995, Cl. 315-209.00R.
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Larrauri, Jose M.; Arias, Beairit C.; and Galiasso, Roberto E., 4,508,616, Cl. 208-111.000.
Galindo, Anibal. Hypodermic needle connector. 4,508,419, Cl. 339-256.00S.
Gallios, George C., to Venus Scientific Inc. Three phase a.c. to d.c. voltage converter with improved power line harmonic current reduction. 4,509,108, Cl. 363-45.000.
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Hansson, Ingvar J. M.; Hakansson, Hakan B.; Igefjord, Magnus G. K.; and Wall, Berth-Ove G., 4,507,854, Cl. 29-612.000.
Gandhi, Haren S.: *See*—
Adams, Karen M.; and Gandhi, Haren S., 4,508,691, Cl. 423-213.500.
Gaponov, Valery M.: *See*—
Spektor, Jury N.; Gaponov, Valery M.; and Masovich, Felix Z., 4,508,391, Cl. 299-43.000.
Garages Mutualistes Francais: *See*—
Schermann, Maurice, 4,507,872, Cl. 33-174.00R.
Gardineer, Bayard; and Vilkomerson, David, to Ultramed, Inc. Ultrasonic scanning apparatus and techniques. 4,508,122, Cl. 128-660.000.
Gardiner, George K.; and Norris, Dean E., to Motorola, Inc. Anti-stalling rotating antenna buoy system using wind deflecting plates. 4,509,054, Cl. 343-709.000.
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Ramirez, Joe D.; Gorin, Steven E.; and Garnett, William A., 4,508,490, Cl. 417-234.000.
Garrett Corporation, The: *See*—
Manatt, Scott A., 4,508,548, Cl. 55-158.000.
Thurston, John F., 4,508,127, Cl. 137-8.000.
Wieland, Kurt H., 4,507,939, Cl. 62-402.000.
Garver, Edward B., Sr.; and Zabielski, Kenneth D., to Baxter Travenol Laboratories, Inc. Assembly employing a breakable thermal bond

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Gaskins, Karl S. Resilient bladder type suspension system for a support structure such as a chair, bed, or the like. 4,508,383, Cl. 297-284.000.
Gasland, Stein. Process for manufacturing of formed products. 4,508,595, Cl. 162-158.000.
Gay, William H.: *See*—
Kukowski, John A.; Soth, Henry J.; and Gay, William H., 4,507,862, Cl. 29-837.000.
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Bush, J. Finley; and Gaydoski, Gary F., 4,508,689, Cl. 423-127.000.
Gazard, Maryse: *See*—
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Gebauer, Paul W.; and Choi, Smith. Golf club. 4,508,349, Cl. 273-175.000.
Geberth, John D., Jr. Reversible spray tip. 4,508,268, Cl. 239-119.000.
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Finkelstein, Wolfgang; and Riegel, Hans, 4,508,022, Cl. 98-40.120.
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Graham, Marshall D.; Cook, Dudley D., Jr.; Gecks, Donald L.; and Shaw, Robert, 4,508,435, Cl. 350-529.000.
Geering, Emil J.: *See*—
Chow, Richard H.; and Geering, Emil J., 4,508,661, Cl. 260-544.00D.
Chow, Richard H.; and Geering, Emil J., 4,508,857, Cl. 260-544.00D.
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GenCorp Inc.: *See*—
Brown, Robert L.; Jones, William A.; and Anderson, Daryl E., 4,508,586, Cl. 156-401.000.
General Dynamics, Pomona Division: *See*—
Jones, Richard W., 4,508,293, Cl. 244-3.150.
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Anderson, John M., 4,508,993, Cl. 315-59.000.
Avakian, Roger W., 4,508,861, Cl. 524-101.000.
Craig, Edwin R.; and Blumberg, Ben, Jr., 4,508,677, Cl. 376-174.000.
Ladusaw, William T., 4,508,987, Cl. 310-68.00C.
Malinowski, Richard F., 4,509,107, Cl. 362-267.000.
Matzner, Bruce; Horn, Victor M.; Curulla, Michael V.; and Price, John F., 4,508,679, Cl. 376-438.000.
Steinert, Leopold A.; and Perry, Richard W., 4,507,840, Cl. 29-401.100.
Vermilyea, Mark E., 4,509,030, Cl. 335-216.000.
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Fulger, Charles V.; Stahl, Howard D.; Turek, Evan J.; and Bayha, Renee, 4,508,745, Cl. 426-594.000.
McSweeney, Daniel R., 4,508,740, Cl. 426-250.000.
General Motors Corporation: *See*—
Fattic, Gerald T.; and Vukovich, William J., 4,509,125, Cl. 364-424.100.
Suchdev, Jagan N., 4,508,065, Cl. 123-41.350.
General Signal Corporation: *See*—
Korowitz, Simon, 4,509,117, Cl. 364-200.000.
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Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, 4,508,785, Cl. 428-424.400.
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Ingalls, Robert, 4,508,936, Cl. 179-82.000.
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Cash, Carlton H., 4,509,052, Cl. 343-418.000.
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Scholdstrom, Ragnar; Marcus, Holger; and Nordstrom, Lennart, 4,508,448, Cl. 356-5.000.
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Langhoff, Joseph; Althoff, Erwin; Kolodzey, Wolfgang; and Gerhardus, Ulrich, 4,508,542, Cl. 48-77.000.
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Hanulik, Jozef, 4,508,641, Cl. 252-626.000.
Giffen, William M., Jr.; Li, George S.; and Miller, Arthur F., to Standard Oil Company, The. Imidized surface protection for maleic anhydride interpolymer articles. 4,508,787, Cl. 428-473.500.
Gijsbers, Jan C.: *See*—
Van de Leest, Renaat E.; and Gijsbers, Jan C., 4,509,161, Cl. 369-275.000.
Gilbert, Wilbur E.; Martin, Robert E.; and Belonger, Donald P., to Hamilton Industries, Inc. Leg and foot support assembly for medical examination table. 4,508,387, Cl. 297-429.000.
Gillery, F. Howard; and Criss, Russell C., to PPG Industries, Inc. Low reflectance, low emissivity sputtered film. 4,508,789, Cl. 428-630.000.
Gillespie, C. Earl, Jr. Basketball goal height reducing frame. 4,508,337, Cl. 273-1.50R.
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Bhise, Vijay S.; and Gilman, Harold, 4,508,927, Cl. 568-858.000.
Giner, Inc.: *See*—
Giner, Jose D., 4,508,598, Cl. 204-1.00T.
Giner, Jose D., to Giner, Inc. Gas sensor and method of using same. 4,508,598, Cl. 204-1.00T.
Girsch, B. J. Maria; Girsch, Charles W.; and McCarthy, Thomas C., to Hasbro Industries, Inc. Shape-matching toy apparatus with safety hinge. 4,508,512, Cl. 434-259.000.
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Crameri, Yvo; Ochsner, Paul A.; and Schudel, Peter, 4,508,925, Cl. 568-442.000.
Virgilio, Joseph A.; Manowitz, Milton; and Heilweil, Emanuel, 4,508,908, Cl. 548-213.000.
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GKN Technology Limited: *See*—
Marsh, Barry J., 4,508,325, Cl. 267-47.000.
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Weinberg, Roger A.; and Glaser, Mark C., 4,508,167, Cl. 166-120.000.
Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, to Schott Glaswerke. Spectacle glass with increased refractive index. 4,508,834, Cl. 501-73.000.
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Beerwald, Hans; Boehm, Guenter; and Glomski, Guenter, 4,508,554, Cl. 65-3.100.
Godar, Richard L.: *See*—
Heintzelman, William J.; and Godar, Richard L., 4,508,637, Cl. 252-396.000.
Goddard, John B.; and Johnson, William N., to Union Carbide Corporation. Extraction of tungsten from spent or scrap catalyst materials. 4,508,701, Cl. 423-61.000.
Goel, Anil B., to Ashland Oil, Inc. Method for preparing acyloxy styrenes. 4,508,653, Cl. 260-410.500.
Gold, Kenneth R.: *See*—
LoFaso, Joseph S.; LoFaso, Mardi I.; and Gold, Kenneth R., 4,507,988, Cl. 81-3.090.
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Merril, Carl R.; and Goldman, David, 4,508,820, Cl. 435-29.000.
Gomi, Hiromi: *See*—
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, 4,508,680, Cl. 419-5.000.
Gonzalez, Carlos F., to Microlife Technics, Inc. Non-sucrose fermenting *Pedioccus pentosaceus*. 4,508,738, Cl. 426-55.000.
Goodell, Daniel L., to Figgie International Inc. Guide finger mounting for case packer assembly heads. 4,507,905, Cl. 53-262.000.
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Beres, Arthur W.; and Verderico, Joseph P., 4,508,497, Cl. 425-28.00R.
Throckmorton, Morford C., 4,508,881, Cl. 526-201.000.
Wideman, Lawson G.; and Bente, Lynn A., 4,508,930. Cl. 585-377.000.
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Gopikanth, Mysore L.; and Kuo, Han C., to Duracell Inc. Cell with $NiCl_2$ cathode. 4,508,799, Cl. 429-196.000.
Gopikanth, Mysore L.; Kuo, Han C.; and Schlaikjer, Carl R., to Duracell Inc. Cell with $FeBr_3$ cathode. 4,508,800, Cl. 429-196.000.
Gorin, Steven E.: *See*—
Ramirez, Joe D.; Gorin, Steven E.; and Garnett, William A., 4,508,490, Cl. 417-234.000.
Gornall, Graham J.; Price, Anthony G.; and Parry, David, to Lucas Industries. Spreading type disc brakes for vehicles. 4,508,198, Cl. 188-71.400.
Gorog, Sandor: *See*—
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Goscenski, Edward J., Jr., to Eaton Corporation. Single shaft positive drive. 4,507,984, Cl. 74-650.000.
Gosudarstvenny Proektno-Konstruktorsky I Experimentalny Institut Ugolnogo Mashinostroenia: *See*—
Spektor, Jury N.; Gaponov, Valery M.; and Masovich, Felix Z., 4,508,391, Cl. 299-43.000.
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Goto, Kunio: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,509,064, Cl. 346-207.000.
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Gould Inc.: *See*—
Busta, Heinz H.; Tsao, Kuey-Yeou; White, Wayne D.; and Loeppert, Peter V., 4,508,613, Cl. 204-418.000.
Feldman, Karl T., Jr., 4,508,934, Cl. 174-101.500.
Harris, Robert W., 4,509,037, Cl. 340-347.0AD.

Grabhoefer, Herbert; and Volkert, Otto, to BASF Aktiengesellschaft. Cellular, molded polyurethane parts, process for their preparation by thermoforming of polyester-urethane foam and their use. 4,508,774, Cl. 428-220.000.

Graf, Matthew C.: *See*—
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Graham, Marshall D.; Cook, Dudley D., Jr.; Gecks, Donald L.; and Shaw, Robert, to Coulter Electronics, Inc. Air vacuum chuck for a microscope. 4,508,435, Cl. 350-529.000.

Graham, Marshall D. Magnetic separation using chelated magnetic ions. 4,508,625, Cl. 210-695.000.

Granryd, Thorvald G., to TG Strips, Inc. Retractable traction intensifying means for agricultural tractors and the like. 4,508,150, Cl. 152-169.000.

Graser, Earl J., to Manville Service Corporation. Sleeve-style beverage carton. 4,508,258, Cl. 229-38.000.

Gravesteijn, Dirk J.; Steenbergen, Christiaan; Van der Veen, Jan; and Nijssen, Wilhelmus P. M., to U.S. Philips Corporation. Recording element having a pyrylium or thiopyrylium-squarylium dye layer and new pyrylium or thiopyrylium-squarylium compounds. 4,508,811, Cl. 430-270.000.

Green, David; and Blanc, Maurice, to Societe d'Assistance Technique pour Produits Nestle S.A. Caffeine adsorption. 4,508,743, Cl. 426-422.000.

Green, David T., to United States Surgical Corporation. Surgical fastener applying apparatus. 4,508,253, Cl. 227-19.000.

Green, Linda S.: *See*—
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Gregor Jonsson Associates, Inc.: *See*—
Betts, Edmund D.; and Keith, Jon T., 4,507,825, Cl. 17-73.000.

Grenn, James F. Check means for a water dispenser. 4,508,246, Cl. 222-477.000.

Grenon, Rene . Metal binding wire twisting device. 4,508,030, Cl. 100-26.000.

Gress, Ronald A. Airbrush assembly. 4,508,271, Cl. 239-305.000.

Griffin, Brian P.: *See*—
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Griffin, Joseph: *See*—
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Gronholm, Richard A.: *See*—
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Grove, Arthur W.: *See*—
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Grunberg, Robert M. Time domain audio panner. 4,509,185, Cl. 381-34.000.

Gruppo Lepetit S.p.A.: *See*—
Mariani, Luigi; and Tarzia, Giorgio, 4,508,730, Cl. 514-218.000.

GTE Automatic Electric Inc.: *See*—
Renner, Robert E., 4,509,168, Cl. 370-63.000.
Renner, Robert E., 4,509,169, Cl. 370-63.000.
Stepan, William E.; Neese, Wayne E.; Belanger, Thomas D., Jr.; and Janninck, Robert F., 4,508,398, Cl. 339-17.0LM.
Stepan, William E., 4,508,753, Cl. 427-53.100.
Stepan, William E., 4,508,754, Cl. 427-53.100.

GTE Laboratories Incorporated: *See*—
Freeman, Eva C.; and Baird, Donald H., 4,508,610, Cl. 204-192.00P.
Kapral, Christopher W.; and Cooperman, Michael, 4,508,982, Cl. 307-572.000.

GTE Products Corporation: *See*—
Cheney, Richard F., 4,508,788, Cl. 428-570.000.
English, George J., 4,508,514, Cl. 445-26.000.

Guedj, F.; Defaucheux, J.; and Wiart, A., to Jeumont-Schneider Corporation. Variable reluctance electric motor for the translation of control rods in a nuclear reactor. 4,508,984, Cl. 310-14.000.

Guerreau, Rene : *See*—
Beyl, Jean; Bernard, Jean; Guerreau, Rene ; le Faou, Daniel; and Peyre, Henri, 4,508,360, Cl. 280-605.000.

Guex, Betty S.: *See*—
Strom, Larry O.; and Guex, Betty S., 4,508,107, Cl. 128-54.000.

Guglielmetti, Leonardo, to Ciba Geigy Corporation. 4-Styryl-4'-vinylbiphenyls, the production thereof and use thereof as fluorescent. 4,508,784, Cl. 252-301.210.

Guidotti, Ronald A.: *See*—
Delnick, Frank M.; Guidotti, Ronald A.; and McCarthy, David K., 4,508,796, Cl. 429-112.000.

Guilbert, Jean M. A. M.: *See*—
Mouilhayrat, Guy G.; Duchon, Paul A. J.; Guilbert, Jean M. A. M.; and Rolfo, Andre A., 4,508,297, Cl. 244-173.000.

Guimond, Roy A.; Gulliksen, John E.; and Reed, Nanci W., to Koehler Manufacturing Company. Lead acid battery with self-registering grid complement and methods of making and operating same. 4,508,801, Cl. 429-238.000.

Gulliksen, John E.: *See*—
Guimond, Roy A.; Gulliksen, John E.; and Reed, Nanci W., 4,508,801, Cl. 429-238.000.

Gumaer, Robert A.; and Mortenson, John A., to International Business Machines Corporation. Method for managing a buffer pool referenced by batch and interactive processes. 4,509,119, Cl. 364-200.000.

Gumb, Bev W. T.: *See*—
Reintjes, Anthony B.; Fleming, Robert J.; and Gumb, Bev W. T., 4,508,755, Cl. 427-58.000.

Gunning, William J., III; and Tracy, John M., to Rockwell International Corporation. Electro-optically tuned rejection filter. 4,508,964, Cl. 250-201.000.

Gunter, William L.: *See*—
Lawson, William J.; and Gunter, William L., 4,507,813, Cl. 4-253.000.

Haag, Werner O.; Olson, David H.; and Rodewald, Paul G., to Mobil Oil Corporation. Catalytic conversion process for aromatic feedstocks with hydrogen regeneration of coke-selectivated zeolite catalyst. 4,508,836, Cl. 502-53.000.

Haas, Anton J., Jr. Cable sheath cutter knife. 4,507,867, Cl. 30-90.400.

Haase, Walter. Pipette for carrying out and determining sedimentation rates, in particular that of blood. 4,507,955, Cl. 73-61.400.

Habu, Yasuhiro: *See*—
Nakato, Hakaru; Sakuraya, Toshikazu; Habu, Yasuhiro; Emi, Toshihiko; Kodama, Masanori; Koshikawa, Takao; Yoshida, Yoshimitsu; and Shimokawa, Fumitaka, 4,508,571, Cl. 106-38.280.

Hachimoto, Akihiko: *See*—
Matsuzaki, Minoru; Hachimoto, Akihiko; Inoue, Takashi; Shirai, Hitoshi; Watanabe, Akira; and Tofukuji, Ikuo, 4,508,443, Cl. 354-402.000.

Hacker, Karl M. Tool for removing and replacing wheelbearings. 4,507,838, Cl. 29-263.000.

Hadley, Howard C.: *See*—
Deutsch, Timothy A.; and Hadley, Howard C., 4,508,243, Cl. 222-142.000.

Haendel, Richard S.; and Wauer, John C., to Rockwell International Corporation. FMCW system for providing search-while-track functions and altitude rate determination. 4,509,049, Cl. 343-7.500.

Hager, Ira V. Heat collection, dissipation and storage. 4,508,102, Cl. 126-437.000.

Hahn, James H., to Rush, David H. Brushless disc-type DC motor or generator. 4,508,998, Cl. 318-138.000.

Hait, Paul W., to Pyromid, Inc. Convertible cooking unit. 4,508,094, Cl. 126-9.00R.

Hajdu, Istvan: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,508,926, Cl. 568-766.000.

Hajime Industries Ltd.: *See*—
Yoshida, Hajime, 4,509,076, Cl. 358-106.000.

Hakansson, Hakan B.: *See*—
Hansson, Ingvar J. M.; Hakansson, Hakan B.; Igefjord, Magnus G. K.; and Wall, Berth-Ove G., 4,507,854, Cl. 29-612.000.

Halcon SD Group, Inc., The: *See*—
Bhise, Vijay S.; and Gilman, Harold, 4,508,927, Cl. 568-858.000.

Hall, George R.; Hall, Robert J.; and Cookerly, Jack C., to Norlin Industries. Method and apparatus for improved automatic harmonization. 4,508,002, Cl. 84-1.030.

Hall, Robert J.: *See*—
Hall, George R.; Hall, Robert J.; and Cookerly, Jack C., 4,508,002, Cl. 84-1.030.

Halliburton Company: *See*—
Borchardt, John K., 4,508,629, Cl. 252-8.55D.
Hamid, Syed, 4,508,133, Cl. 137-68.00R.
Skinner, Neal G.; and Wesson, David S., 4,508,174, Cl. 166-373.000.

Hama, Hiroaki; and Abe, Toshiro, to Mitsubishi Denki Kabushiki Kaisha. System for air-conditioning and hot water supplying. 4,507,938, Cl. 62-324.100.

Hamada, Hideo: *See*—
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,509,124, Cl. 364-424.100.

Hamelin Industries, Inc.: *See*—
LeBlond, Charles E.; and LeBlond, Henri, 4,508,392, Cl. 301-63.0PW.

Hamer, Anthony D.: *See*—
Etherton, Bradley P.; and Hamer, Anthony D., 4,508,843, Cl. 502-115.000.

Hamid, Syed, to Halliburton Company. Protective cover retainer. 4,508,133, Cl. 137-68.00R.

Hamilton Industries, Inc.: *See*—
Gilbert, Wilbur E.; Martin, Robert E.; and Belonger, Donald P., 4,508,387, Cl. 297-429.000.

Hamm, Donald J., to CPC International Inc. Low calorie edible oil substitutes. 4,508,746, Cl. 426-601.000.

Hammarstedt, Gosta, to Arcu Armaturindustri AB. Thermostatic sensor and method of making same. 4,507,921, Cl. 60-527.000.

Hammond, Steve A. Suntan booth. 4,508,120, Cl. 128-372.000.

Handy, Christopher C., Jr.: *See*—
Lorimer, D'Arcy H.; and Handy, Christopher C., Jr., 4,508,688, Cl. 423-92.000.

Handy, Richard L.; and Murray, James A., to Iowa State University Research Foundation, Inc. Method for controlling moisture-expansive clay supporting building foundations. 4,508,472, Cl. 405-229.000.

Haney, Jerry D.: *See*—
Simms, R. John; and Haney, Jerry D., 4,509,075, Cl. 358-106.000.
Hanks, Thomas W.: *See*—
Wiegardt, Gordon K.; Hanks, Thomas W.; and Murphy, Kenneth E., 4,508,176, Cl. 172-7.000.
Hannon, Robert J.: *See*—
Hollinger, David P.; Nelson, David E.; and Hannon, Robert J., 4,509,170, Cl. 370-85.000.
Hansen, Allan H.: *See*—
Pedersen, Svend P.; Molbaek, Jens J.; and Hansen, Allan H., 4,508,262, Cl. 236-42.000.
Hansen, Michael S. Roller reamer/stabilizer. 4,508,184, Cl. 175-346.000.
Hansen, Thomas C. Electronically controlled coil assembly. 4,509,109, Cl. 363-126.000.
Hansson, Ingvar J. M.; Hakansson, Hakan B.; Igefjord, Magnus G. K.; and Wall, Berth-Owe G., to Gambro Crafon AB. Method of manufacturing temperature-sensitive instruments. 4,507,854, Cl. 29-612.000.
Hanulik, Jozef, to Gesellschaft zur Forderung der industrieorientierten. Process for the decontamination of steel surfaces and disposal of radioactive waste. 4,508,641, Cl. 252-626.000.
Hara, Yasuhiko; Akiyama, Nobuyuki; Fushimi, Satoru; Oshima, Yoshimasa; and Aoki, Nobuhiko, to Hitachi, Ltd. Pattern detection system. 4,508,453, Cl. 356-394.000.
Harada, Kazuhiro; Tsuchiya, Yuzoh; Sekiguchi, Nobuo; and Ishikawa, Toshio, to Nippon Telegraph and Telephone Public Corp.; and Showa Electric Wire & Cable Co. Cable pulling/feeding apparatus. 4,508,251, Cl. 226-25.000.
Harada, Yuji, to Canon Kabushiki Kaisha. Ink projections on the polarizer of an electro-optic display. 4,508,428, Cl. 350-337.000.
Harata, Mituo; Hiraki, Hideaki; Uno, Shigeki; Sakuma, Kazuo; and Matsunaga, Kiyosi, to Tokyo Shibaura Denki Kabushiki Kaisha. Humidity-sensitive element and process for producing the same. 4,509,035, Cl. 338-35.000.
Hargreaves, Rodney B., to Imperial Chemical Industries, PLC. Pyridazin-3-one derivatives. 4,508,721, Cl. 514-252.000.
Harlan, Wayne E.: *See*—
Lagoni, William A.; and Harlan, Wayne E., 4,509,080, Cl. 358-166.000.
Harrell, Bruce W. Detachable shoe-pocket system. 4,507,882, Cl. 36-136.000.
Harrington, John A., to Minnesota Mining and Manufacturing Company. Apparatus for producing a code word. 4,509,194, Cl. 382-56.000.
Harris, Philip H., to Texas Industries, Inc. Co-production of cementitious products. 4,508,573, Cl. 106-100.000.
Harris, Robert N.; and McGuire, Michael E., to Ericsson, Inc. Tandem stripping and reversing apparatus. 4,508,278, Cl. 242-1.000.
Harris, Robert W., to Gould Inc. Enhanced delta modulation encoder. 4,509,037, Cl. 340-347.0AD.
Harrison, Anthony W., to Lucas Industries public limited company. Hydraulic flow control valves. 4,508,140, Cl. 137-501.000.
Harshbarger, John H., to Visual Information Institute, Inc. Interlace detector. 4,509,079, Cl. 358-165.000.
Hartco Company: *See*—
Pearson, Kenneth C., 4,508,220, Cl. 206-343.000.
Hartsock, Dale L., to Ford Motor Company. Ceramic head for internal combustion engine. 4,508,066, Cl. 123-41.710.
Haruhara, Kazuyoshi, to Casio Computer Co., Ltd. Printing apparatus with computer control of impressing a print setting mark on a recording sheet for realignment. 4,508,462, Cl. 400-70.000.
Hasbro Industries, Inc.: *See*—
Girsch, B. J. Maria; Girsch, Charles W.; and McCarthy, Thomas C., 4,508,512, Cl. 434-259.000.
Hasegawa, Akira: *See*—
Kishida, Kazuo; Hasegawa, Akira; and Sugimori, Masahiro, 4,508,875, Cl. 525-308.000.
Hasegawa, Shumpei; and Yamato, Akihiro, to Honda Giken Kogyo Kabushiki Kaisha; and Matsushita Electric Industrial Co., Ltd. Electronic fuel injection control system for multi-cylinder internal combustion engines. 4,508,083, Cl. 123-491.000.
Hasegawa, Shumpei; and Kishi, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling fuel supply to an internal combustion engine after termination of fuel cut. 4,508,088, Cl. 123-493.000.
Haselswerdt, Vernon: *See*—
Mayfield, John M., Jr.; and Haselswerdt, Vernon, 4,508,132, Cl. 137-62.000.
Hashiguchi, Makoto: *See*—
Yamato, Akihiro; and Hashiguchi, Makoto, 4,508,074, Cl. 123-327.000.
Hashimoto, Masao; and Kato, Katsumi, to Seikosha Co., Ltd. Clock having a rotationally displaceable clock movement. 4,508,459, Cl. 368-276.000.
Hatakeyama, Tetsuya: *See*—
Kanda, Masahiro; Hatakeyama, Tetsuya; and Morito, Yusuke, 4,508,640, Cl. 252-503.000.
Hatch, Roger C.: *See*—
Booth, Nicholas H.; Hatch, Roger C.; and Crawford, Lester M., 4,508,715, Cl. 514-280.000.
Hatori, Masami; Ohkuma, Hiroaki; Konishi, Masataka; Miyaki, Takeo; and Kawaguchi, Hiroshi, to Bristol-Myers Company. Antitumor antibiotics BBM-2040A and BBM-2040B. 4,508,647, Cl. 260-239.30T.
Hausberg, Hans-Heinrich; Prucher, Helmut; Uhl, Jurgen; Seyfried, Christoph; and Minck, Klaus, to Merck Patent Gesellschaft mit beschrankter Haftung. Basic ethers useful as antidepressant agents. 4,508,732, Cl. 514-466.000.
Hauser, Herbert J., Jr.: *See*—
Kabele, Dennis F.; and Hauser, Herbert J., Jr., 4,508,019, Cl. 92-158.000.
Hausser, Horst, to Horst Hausser Metallwaren GmbH. Furniture fitting. 4,508,302, Cl. 248-297.300.
Hawes, David H., to Westvaco Corporation. Discontinuous fiber pretreatment. 4,508,860, Cl. 524-13.000.
Hawes, Debra K., to Rockwell International Corporation. Continuous form paper with pull tabs for easier separation. 4,508,365, Cl. 281-2.000.
Hawker, Fred D.: *See*—
Noren, Gerry K.; Poklacki, Erwin S.; Hawker, Fred D.; and Sich, Janice M., 4,508,889, Cl. 528-28.000.
Hayashi, Kimiaki: *See*—
Yoneda, Naoto; Kato, Jyoji; Hayashi, Kimiaki; Ochini, Takashi; and Kinashi, Keizo, 4,508,727, Cl. 514-398.000.
Hayashi, Yoshio; Aoyagi, Kouji; Sakurai, Toshio; Kashima, Tusnehiro; and Higeta, Koichi, to Sony Corporation. Word processor. 4,509,138, Cl. 364-900.000.
Hayosh, Robert J.; Lewis, Robert H.; and Simon, Frederick A., to Ford Motor Company. Tape deck with take-up reel rotation sensor configured to prevent tape windup on the capstan or pinch roller. 4,508,280, Cl. 242-191.000.
Haze, Setsuo: *See*—
Minamida, Kazukiyo; Haze, Setsuo; and Yamada, Seiji, 4,508,185, Cl. 177-1.000.
Health-Mor, Inc.: *See*—
Martinec, Eugene F., 4,507,819, Cl. 15-321.000.
Heath, Chester A., to International Business Machines Corporation. Peripheral interface adapter circuit for use in I/O controller card having multiple modes of operation. 4,509,113, Cl. 364-200.000.
Heber, Helmut; Eberle, Reinhard; and Teetz, Volker, to Behringwerke Aktiengesellschaft. Chromogenic compounds, a process for their preparation and their use. 4,508,644, Cl. 260-112.50R.
Heberlein Maschinenfabrik AG: *See*—
Simmen, Christian, 4,507,833, Cl. 28-254.000.
Heckl, Franz; and Herget, Herbert, to Lenser Verwaltungs-GmbH. Snap-together filter-plate assembly. 4,508,623, Cl. 220-229.000.
Hedlund, Martin L.: *See*—
Leirnes, Johan S.; Lundstrom, Malkolm S.; Hedlund, Martin L.; and Buren, Kurt J. A., 4,508,565, Cl. 75-77.000.
Heeren, Vernon L., to Raytheon Company. RF Applicator for in situ heating. 4,508,168, Cl. 166-248.000.
Hees, Eckart: *See*—
Bauer, Gerhard; Hees, Eckart; and Beckers, Karl-Dieter, 4,508,241, Cl. 222-600.000.
Hegarty, Bernard L. Fence system. 4,508,320, Cl. 256-47.000.
Heiart, Robert B.; and Cohen, Abraham B., to Du Pont de Nemours, E. I., and Company. Multiple registration and imaging process to form a set of registered imaged elements. 4,508,802, Cl. 430-22.000.
Heidemann, Albert: *See*—
Wurster, Ewald; and Heidemann, Albert, 4,508,991, Cl. 313-579.000.
Heilweil, Emanuel: *See*—
Virgilio, Joseph A.; Manowitz, Milton; and Heilweil, Emanuel, 4,508,908, Cl. 548-213.000.
Heimlicher, Peter, to Contrinex S.A.; and Siemens Aktiengesellschaft, a part interest. Oscillator with a temperature compensated oscillating coil. 4,509,023, Cl. 331-176.000.
Heina, Karl-Fritz: *See*—
Klenk, Emil; and Heina, Karl-Fritz, 4,508,214, Cl. 198-833.000.
Heine, Otto R., to R&H Technology, Inc. High capacity linear rotary bearing. 4,508,395, Cl. 308-6.00C.
Heinemann, Henning: *See*—
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,508,716, Cl. 514-220.000.
Heintzelman, William J.; and Godar, Richard L., to Petrolite Corporation. Mixtures of alkyl and alkenyl succinic acids and polymer acids. 4,508,637, Cl. 252-396.000.
Heiss, Lorenz, to Hoechst Aktiengesellschaft. Process for the preparation of 4,4'-bis[benz(ox, othi or imid)azol-2-yl]stilbenes. 4,508,903, Cl. 548-156.000.
Heiz, Ulrich, to Inventio AG. Installation for the automatic removal and reception of loads through the intermediary of transport vehicles. 4,508,484, Cl. 414-337.000.
Helmond, Johannes: *See*—
van Dijk, Jacob; Renken, Johannes W.; Dekker, Jan G.; and Helmond, Johannes, 4,508,652, Cl. 260-407.000.
Helms, Thomas G. Compact heavy duty lifting crane. 4,508,233, Cl. 212-182.000.
Hemme, Wilbur F., to Eaton Corporation. Gas valve. 4,508,314, Cl. 251-11.000.
Hemphill, Charles W. System for efficiently converting hydrocarbons into power. 4,507,924, Cl. 60-595.000.
Henderson, Lawrence E., to Emergency Power Engineering, Inc. Emergency power system and logic therefor. 4,508,974, Cl. 307-66.000.
Henkel Corporation: *See*—
Whyzmuzis, Paul D.; and Spinks, Anne E., 4,508,868, Cl. 524-607.000.
Henkel Kommanditgesellschaft: *See*—
Kluth, Hermann; and Meffert, Alfred, 4,508,853, Cl. 521-107.000.
Henshaw, Philip D., to Massachusetts Institute of Technology. Photorefractive laser beamsteering device. 4,508,431, Cl. 350-354.000.

Hepburn, George R., to Dynasplint Systems, Inc. Adjustable splint. 4,508,111, Cl. 128-87.00R.
Hepfer, Rolf; and Runzler, Jurgen, to Joseph Kieninger Uhrenfabrik GmbH. Striking clock with device for disconnecting the striking mechanism. 4,508,456, Cl. 368-262.000.
Herbert, Paul F.: *See*—
Cowell, Peter A.; and Herbert, Paul F., 4,508,178, Cl. 172-239.000.
Herbert, Tony E. G., to Rotaflex p.l.c. Electrical supply connector for continuous outlet track. 4,508,400, Cl. 339-22.00R.
Herbertz, Toni: *See*—
Reinehr, Ulrich; Herbertz, Toni; and Jungverdorben, Hermann-Josef, 4,508,672, Cl. 264-78.000.
Herbulot, Jean; and Jumel, Bernard, to Valeo. Brake shoe. 4,508,199, Cl. 188-250.00B.
Hergenrother, William L.; Matlock, Mark G.; and Ambrose, Richard J., to Firestone Tire & Rubber Company, The. Impact resistant polymeric compositions containing polyamides, maleic anhydride adducts of hydrogenated polymers and graft copolymers thereof. 4,508,874, Cl. 525-285.000.
Herget, Herbert: *See*—
Heckl, Franz; and Herget, Herbert, 4,508,623, Cl. 220-229.000.
Herloski, Robert P., to Xerox Corporation. Holographic scanning system utilizing a scan linearization lens. 4,508,421, Cl. 350-3.710.
Herman, Timm R.; and Mikic, Frank, to Snap-on Tools Corporation. Quick release mechanism for ratchet wrench. 4,508,005, Cl. 81-177.00G.
Hermann Berstorff Maschinenbau GmbH: *See*—
Anders, Dietmar, 4,508,454, Cl. 366-80.000.
Hermans, Jacobus G. J. M.: *See*—
Mulders, Gerardus L. M.; and Hermans, Jacobus G. J. M., 4,508,471, Cl. 405-109.000.
Herr, Diane E.: *See*—
Bantel, Richard G.; and Herr, Diane E., 4,509,167, Cl. 370-62.000.
Herring, Asa. Snap-on plastic cover for sun-damaged vinyl covered dashboard pads and method of making. 4,508,381, Cl. 296-70.000.
Herronen, John R.: *See*—
Bolle, Fred; Herronen, John R.; and Wright, Joseph M., 4,508,212, Cl. 198-781.000.
Hertzenberg, Elliot P.: *See*—
McLaughlin, John R.; and Hertzenberg, Elliot P., 4,508,742, Cl. 426-330.400.
Herubel, Jean-Frederic, to N. Schlumberger and Cie. Automatic machine for splitting butchery animals, notably pigs. 4,507,822, Cl. 17-23.000.
Hessling, Heinz W.; and Weykam, Gottfried J., to Weykam, Gottfried J. Lifting device for a magazine for empty pallets in an automatic palletizing machine. 4,508,483, Cl. 414-127.000.
Hettinger, William P., Jr.: *See*—
Zandona, Oliver J.; Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., 4,508,839, Cl. 502-65.000.
Hewlett-Packard Company: *See*—
Bartlett, Keith G.; and Caolo, Mary A., 4,508,591, Cl. 156-659.100.
Casciani, James R., 4,508,965, Cl. 250-231.0SE.
Low, Robert N.; Cloutier, Frank L.; and Siewell, Gary, 4,509,062, Cl. 346-140.00R.
Heywang, Hermann: *See*—
Behn, Reinhard; Heywang, Hermann; and Pachonik, Horst, 4,508,049, Cl. 118-50.100.
Hickethier, Craig R.; Hogan, Ronald E.; and Prahl, Marvin E., to International Business Machines Corporation. Method and apparatus for loading and registering a diskette in a diskette drive. 4,509,086, Cl. 360-99.000.
Hickling, Michael: *See*—
Ring, John; French, David; Hickling, Michael; and Sturgess, Michael G., 4,508,765, Cl. 427-386.000.
Hickman, Mark R.; and Brown, Michael M., to Vee Arc Corporation. Adjustable frequency drive. 4,508,976, Cl. 307-270.000.
Hicks, Robert R. Variable access parcel and mail receptacle. 4,508,259, Cl. 232-17.000.
Higeta, Koichi: *See*—
Hayashi, Yoshio; Aoyagi, Kouji; Sakurai, Toshio; Kashima, Tusnehiro; and Higeta, Koichi, 4,509,138, Cl. 364-900.000.
Higuchi, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Passive seat belt device. 4,508,362, Cl. 280-804.000.
Higuchi, Masayuki: *See*—
Tomino, Tadashi; and Higuchi, Masayuki, 4,508,402, Cl. 339-17.0CF.
Hijiya, Toyoto: *See*—
Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,508,912, Cl. 549-253.000.
Hill, Michael R. H.: *See*—
Moseley, Patrick T.; and Hill, Michael R. H., 4,508,147, Cl. 141-1.100.
Hilti Aktiengesellschaft: *See*—
Klueber, Wilhelm, 4,508,180, Cl. 173-104.000.
Hineline, Edson S., Jr.: *See*—
Bench, Ronald W.; and Hineline, Edson S., Jr., 4,508,938, Cl. 179-90.0BD.
Hinkle, Donald H., to Dana Corporation. Extractor tool. 4,507,837, Cl. 29-262.000.
Hintsch, Otto, to Sulzer Brothers Limited. Gripper projectile for a weaving machine. 4,508,146, Cl. 139-196.200.
Hiraiwa, Kazuyoshi; and Yamasaki, Saburou, to Nissan Motor Company, Limited. Transmission shift control mechanism. 4,507,981, Cl. 74-477.000.
Hiraki, Hideaki: *See*—
Harata, Mituo; Hiraki, Hideaki; Uno, Shigeki; Sakuma, Kazuo; and Matsunaga, Kiyosi, 4,509,035, Cl. 338-35.000.
Hirano, Akira, to Nippon Electric Co., Ltd. Code-converting system for band compression of digital signals. 4,509,038, Cl. 340-347.0DD.
Hirano, Shigeo: *See*—
Yamamuro, Kiyohiko; Hirano, Shigeo; Itoh, Isamu; and Iwasa, Yasuo, 4,508,816, Cl. 430-393.000.
Hirao, Yasutaka: *See*—
Suzuki, Koichi; Oose, Seiroku; So, Yuzo; and Hirao, Yasutaka, 4,509,104, Cl. 362-32.000.
Hirata, Toshiyuki: *See*—
Takeda, Keisou; and Hirata, Toshiyuki, 4,508,264, Cl. 237-12.30B.
Hirbour, Louis: *See*—
Johnson, Frank; Reese, Dieter; and Hirbour, Louis, 4,508,611, Cl. 204-202.000.
Hirohata, Michio, to Canon Kabushiki Kaisha. Electromagnetically driven shutter camera having automatic focusing device. 4,508,442, Cl. 354-400.000.
Hiromitsu, Naka. Access door and framing apparatus for the access door's framework. 4,507,836, Cl. 29-252.000.
Hirose Electric Co., Ltd.: *See*—
Kawanami, Norihide; Miyake, Yukinori; Kawamura, Kenji; and Toda, Toshiharu, 4,509,090, Cl. 361-119.000.
Hirose, Etsuro; Takahashi, Kimio; Mori, Toshiro; and Kaito, Haruyuki, to Hitachi, Ltd. Washing machine with drier. 4,507,942, Cl. 68-20.000.
Hirose, Masashi: *See*—
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Hirsch, John L.; and VanVoorst, Gene A., to Curt G. Joa, Inc. Pad-cross folder. 4,508,528, Cl. 493-426.000.
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Key, Thomas J.; and Forbes, Ervin, 4,509,121, Cl. 364-200.000.
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Honickman, Reuben. Wall unit. 4,508,231, Cl. 211-199.000.
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Horace Small Manufacturing Company: *See—*
Small, Irvin L., 4,507,802, Cl. 2-2.500.
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Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,508,805, Cl. 430-72.000.
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Hoshiko Medical Laboratories, Inc.: *See—*
Hoshiko, Yoshinori, 4,508,700, Cl. 423-579.000.
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Houlbrook, Kenneth; and Thornton, Paul A., to Clantex Limited. Dispensers for flowable compositions. 4,508,245, Cl. 222-327.000.
Howes, Peter, to Lucas Industries public limited company. Fuel injection pumps. 4,508,489, Cl. 417-221.000.
Howkins, Stuart D., to Exxon Research & Engineering Co. Method of operating an ink jet. 4,509,059, Cl. 346-1.100.
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Hsiao, Charles H., to Key Pharmaceuticals, Inc. Sustained release aspirin. 4,508,702, Cl. 424-19.000.
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Hubler, Lawrence C.; Ferrara, Joseph J.; Albright, Roger N.; and Bassett, Raymond C., to Xerox Corporation. High speed duplicator with stapler and staple loading arrangement. 4,508,329, Cl. 270-53.000.
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Hughes, Richard L.; and Sigmon, Ned A., to AMP Incorporated. Wire stuffing cover. 4,508,411, Cl. 339-99.00R.
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Atkinson, Gerald O., 4,507,843, Cl. 29-466.000.
Beavers, John A.; and North, Willard F., 4,508,583, Cl. 156-94.000.
Huhn, Magda; Szabo, Gabor; Dvortsak, Peter; Karpati, Marianna; and Somfai, Eva, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Pentahalophenyl ester of cyanoacetic acid derivatives. 4,508,658, Cl. 260-465.00D.
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Hultquist, John V. Force producing and transmitting apparatus. 4,507,951, Cl. 72-431.000.
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Hutchison, Joseph A. Locking means for solar collector. 4,508,426, Cl. 350-614.000.
Hwang, Shih M. Quincunx-shaped lock device. 4,507,945, Cl. 70-363.000.
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Imai, Masao: *See—*
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Ingalls, Robert, to Gentex Corporation. Local external communication system. 4,508,936, Cl. 179-82.000.
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Intel Corporation: *See—*
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INTERCONTROLE Societe Anonyme: *See—*
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Barsotti, Rudolf H.; and Grove, Arthur W., 4,509,007, Cl. 324-60.00C.
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Brannon, James H.; and Lankard, John R., Sr., 4,508,749, Cl. 427-43.100.
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DasGupta, Sumit; Graf, Matthew C.; Rasmussen, Robert A.; and Williams, Thomas W., 4,509,008, Cl. 324-73.00R.
Dorler, Jack A.; Mosley, Joseph M.; and Weitzel, Stephen D., 4,508,981, Cl. 307-542.000.
Fabricius, Karen A.; and Kemlage, Bernard M., 4,508,757, Cl. 427-93.000.
Goth, George R.; and Malaviya, Shashi D., 4,508,579, Cl. 148-175.000.
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International Telephone & Telegraph Corporation: *See—*
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Handy, Richard L.; and Murray, James A., 4,508,472, Cl. 405-229.000.
Irie, Taisuke; Nakagawa, Yoshitaka; Tatano, Masayoshi; Watanabe, Koichi; and Watanabe, Eiji, to Nisshin Steel Company, Ltd. Process for preparing Zn-Ni-alloy-electroplated steel sheets with excellent adherence of the plated layer. 4,508,600, Cl. 204-27.000.
Irwin, Lawrence F. Locking coupling. 4,508,468, Cl. 403-328.000.
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Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, to Toyo Seikan Kaisha, Ltd. Process for preparation of metal vessels. 4,508,481, Cl. 413-1.000.
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Ishigaki, Kunio: *See—*
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Nagae, Yoshiharu; Isogai, Masato; Kawakami, Hideaki; and Nakano, Fumio, 4,508,429, Cl. 350-350.00S.
Isover Saint-Gobain: *See—*
Baduel, Guy M., 4,508,555, Cl. 65-3.430.
Ito, Koichi: *See—*
Sakuta, Masaharu; Kiya, Soichi; Uchizaki. Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, 4,508,572, Cl. 106-90.000.
Ito, Takaaki: *See—*
Tamura, Yoshio; Ito, Takaaki; and Morino, Toshiharu, 4,508,664, Cl. 261-44.00C.
Ito, Toshimitsu; and Norota, Kazuhiko, to Toyota Jidosha Kabushiki Kaisha. Method of electronically controlling fuel injection for internal combustion engine. 4,508,086, Cl. 123-492.000.
Itoh, Hirotaka: *See—*
Kusui, Akio; Morita, Shuji; Kudoh, Toshio; Tanaka, Yasuo; and Itoh, Hirotaka, 4,508,414, Cl. 339-143.00R.
Itoh, Isamu: *See—*
Yamamuro, Kiyohiko; Hirano, Shigeo; Itoh, Isamu; and Iwasa, Yasuo, 4,508,816, Cl. 430-393.000.

Itoh, Jiro, to Rinnai Corporation. Infrared gas burner plate. 4,508,502, Cl. 431-328.000.
Itoh, Tatsuo; and Stephan, Karl D., to Board of Regents, University of Texas System. Quasi-optical polarization duplexed balanced mixer. 4,509,209, Cl. 455-327.000.
ITT Industries, Inc.: *See*—
Belart, Juan, 4,508,008, Cl. 91-372.000.
Elmis, Herbert; and Klar, Adrian, 4,509,072, Cl. 358-17.000.
Ivary, David J.; and Kirby, Raymond L., Jr., to Monarch Marking Systems, Inc. Web feeding method and apparatus for a printer. 4,508,252, Cl. 226-44.000.
Iwahashi, Hiroshi: *See*—
Asano, Masamichi; and Iwahashi, Hiroshi, 4,509,148, Cl. 365-230.000.
Iwai, Noboru; Hirunuma, Masanori; and Kaneko, Junichi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Process and apparatus for producing thermoplastic resin foam. 4,508,669, Cl. 264-36.000.
Iwamoto, Yoshihiki: *See*—
Yatsunami, Kenrow; and Iwamoto, Yoshihiki, 4,509,129, Cl. 364-513.500.
Iwanaga, Yoshiharu, to Ricoh Company, Ltd. System for separating transfer-printing sheet. 4,508,334, Cl. 271-308.000.
Iwasa, Yasuo: *See*—
Yamamuro, Kiyohiko; Hirano, Shigeo; Itoh, Isamu; and Iwasa, Yasuo, 4,508,816, Cl. 430-393.000.
Iwasaki, Nobuyuki: *See*—
Ogawa, Masashi; Ishigaki, Kunio; Iwasaki, Nobuyuki; and Nakamura, Taku, 4,508,818, Cl. 430-523.000.
Iwasaki, Yoshiki: *See*—
Masuda, Isao; Nishikawa, Kazunori; Iwasaki, Yoshiki; and Komura, Makoto, 4,509,155, Cl. 369-48.000.
Iwata, Yoshitaka: *See*—
Tanaka, Hiroshi; and Iwata, Yoshitaka, 4,508,425, Cl. 350-641.000.
Izumi, Hirotaka, to Fuji Xerox Co., Ltd. Sheet conveying device for a copying machine. 4,508,445, Cl. 355-3.0SH.
Izumi, Kazuo; Shimazaki, Kenji; and Seki, Kenji, to Toho Beslon Co., Ltd. Fibrous activated carbon and process of producing it. 4,508,851, Cl. 502-426.000.
J. M. Voith GmbH: *See*—
Beisswanger, Rudolf, 4,508,283, Cl. 242-56.400.
J. P. Tool: *See*—
Peuterbaugh, Bruce G., 4,508,475, Cl. 408-153.000.
Jackson, Bernie F.: *See*—
Borner, Willy; and Jackson, Bernie F., 4,507,964, Cl. 73-462.000.
Jackson, Henry D. Filtration and separation device. 4,508,621, Cl. 210-86.000.
Jackson, Robert M. Process and apparatus for the preparation of dental models. 4,508,506, Cl. 433-74.000.
Jackson, Thomas R. Magnetic denture retention apparatus. 4,508,507, Cl. 433-189.000.
Jacobs, Harold; Dixon, Samuel, Jr.; and Malecki, Edmund E., to United States of America, Army. Single device for measurement of infrared or millimeter wave radiation. 4,509,009, Cl. 324-95.000.
Jagenberg AG: *See*—
Meurer, Wolfgang, 4,507,994, Cl. 83-58.000.
Jager, Lothar; Peter, Anton; and Winkler, Reinhard, to U.S. Philips Corporation. Tape grounding element in a magnetic-tape cassette. 4,509,087, Cl. 360-130.210.
Jain, Atul, to United States of America, National Aeronautics and Space Administration. Method and apparatus for ΔK synthetic aperture radar measurement of ocean current. 4,509,048, Cl. 343-5.0CM.
Jakobson, Sten; and Rabold, Karl, to Alfa-Laval AB. Milking method and an apparatus therefor. 4,508,058, Cl. 119-14.020.
James Burn International Limited: *See*—
Brindle, Robert J., 4,508,366, Cl. 281-36.000.
Jamon, Jacques, to Compagnie Generale des Etablissements Michelin. Wear and licking alarm for crown or disk brake. 4,508,196, Cl. 188-1.110.
Janberg, Klaus; and Dyck, Hans-Peter, to Deutsche Gesellschaft fur Wiederaufarbeitung. Device for holding, transporting and final storing of burned-out reactor fuel elements. 4,508,969, Cl. 250-506.100.
Janian, Robert. Modified C-shaped mechanical spring seal. 4,508,356, Cl. 277-205.000.
Janitzky, Manfred. Underground shelter. 4,507,899, Cl. 52-169.600.
Janke, Jurgen, to Adolf Illig Maschinenbau GmbH & Co. Method and apparatus for controlling the temperature in thermoforming machines. 4,508,670, Cl. 264-40.600.
Janninck, Robert F.: *See*—
Stepan, William E.; Neese, Wayne E.; Belanger, Thomas D., Jr.; and Janninck, Robert F., 4,508,398, Cl. 339-17.0LM.
Jansen, Deborah S.: *See*—
Peoples, Clarence, Jr.; Puydak, Robert C.; and Jansen, Deborah S., 4,508,771, Cl. 428-95.000.
Jansma, Roger H.; and Sandberg, Karen R., to Nalco Chemical Company. Polyaldehyde/polyacetal compositions. 4,508,594, Cl. 162-135.000.
Japan Bano'k Co., Ltd.: *See*—
Furutsu, Akira, 4,507,828, Cl. 24-16.0PB.
Jenck, Jean, to Rhone-Poulenc Chimie de Base. Preparation of alkyl adipates. 4,508,917, Cl. 560-204.000.
Jenne, Gustav. Driving head for pneumatic pile drivers. 4,508,181, Cl. 175-19.000.
Jensen, Ernst; Knappworst, Jurgen; and Stahlmann, Rudolf, to Dynamit Nobel Aktiengesellschaft. Training cartridge with synthetic resin projectile or dummy projectile. 4,508,036, Cl. 102-444.000.
Jeumont-Schneider: *See*—
Salmon, Jean P., 4,508,298, Cl. 246-167.00R.
Jeumont-Schneider Corporation: *See*—
Guedj, F.; Defaucheux, J.; and Wiart, A., 4,508,984, Cl. 310-14.000.
Jido, Morio, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for spray combination of liquids and apparatus therefor. 4,508,265, Cl. 239-3.000.
Jidosha Kiki Co., Ltd.: *See*—
Shimamura, Morihiko; and Uyama, Shintaro, 4,508,009, Cl. 91-376.00R.
Joh, Yasushi; Kaneko, Noriaki; and Nagase, Toshio, to Nippon Zeon Co., Ltd. Cannula. 4,508,535, Cl. 604-282.000.
Johnsey, Walter F.: *See*—
Drummond, Donald D.; Johnsey, Walter F.; and Wood, Roy W., 4,508,183, Cl. 175-69.000.
Johnson, Bruce K., to Polaroid Corporation. Method and apparatus for exposing and viewing at same station. 4,508,437, Cl. 354-78.000.
Johnson, Dean L., to United States of America, National Aeronautics and Space Administration. Reciprocating magnetic refrigerator employing tandem porous matrices within a reciprocating displacer. 4,507,928, Cl. 62-3.000.
Johnson, Frank; Reese, Dieter; and Hirbour, Louis, to Technic, Inc. Apparatus for electroplating and chemically treating the contact elements of encapsulated electronic components and like devices. 4,508,611, Cl. 204-202.000.
Johnson, John K.: *See*—
Kruger, Albert J., Jr.; and Johnson, John K., 4,508,744, Cl. 426-590.000.
Johnson, Nathan D.; Sampson, James D.; and Sampson, Darwin L. Newspaper vending machine. 4,508,238, Cl. 221-107.000.
Johnson, Sigurd A.; Avella, Frank S.; and Jones, Robert I., to Plan Hold Corporation. Tilt lock means for a drafting table. 4,508,305, Cl. 208-455.000.
Johnson, William C. Mouse trap game. 4,508,352, Cl. 273-274.000.
Johnson, William N.: *See*—
Goddard, John B.; and Johnson, William N., 4,508,701, Cl. 423-61.000.
Jones, Marvin R., to Koomey Blowout Preventers, Inc. Valves. 4,508,313, Cl. 251-1.00A.
Jones, Richard W., to General Dynamics, Pomona Division. Seeker-body decoupling system. 4,508,293, Cl. 244-3.150.
Jones, Robert I.: *See*—
Johnson, Sigurd A.; Avella, Frank S.; and Jones, Robert I., 4,508,305, Cl. 208-455.000.
Jones, William A.: *See*—
Brown, Robert L.; Jones, William A.; and Anderson, Daryl E., 4,508,586, Cl. 156-401.000.
Jones, William J.: *See*—
Dufour, Daniel L.; and Jones, William J., 4,508,870, Cl. 525-64.000.
Jorgensen, Helge D., to Superfos Emballage A/S. Plastic handle assembly. 4,507,821, Cl. 16-126.000.
Jorgensen, Jens L.: *See*—
Elepano, Normita P.; Schnur, William H.; and Jorgensen, Jens L., 4,508,634, Cl. 252-163.000.
Jorgensen, Robert J.: *See*—
Beran, Debra L.; Cann, Kevin J.; Jorgensen, Robert J.; Karol, Frederick J.; Maraschin, Norma J.; and Marcinkowsky, Arthur E., 4,508,842, Cl. 502-112.000.
Jorss, Norbert, to Pirzer Co. Pick-up and transfer mechanism for labels or the like. 4,508,330, Cl. 271-33.000.
Joseph, Claude, to Kerma. Ski pole. 4,508,364, Cl. 280-821.000.
Joseph Kieninger Uhrenfabrik GmbH: *See*—
Hepfer, Rolf; and Runzler, Jurgen, 4,508,456, Cl. 368-262.000.
Josephs, Richard M.: *See*—
Wang, Tsing-Chow; and Josephs, Richard M., 4,509,146, Cl. 365-162.000.
Jost, Karel: *See*—
Simek, Petr; Barth, Tomislav; Brtnik, Frantisek; Jost, Karel; Machova, Alena; Servitova, Linda; and Slantinova, Jirina, 4,508,645, Cl. 260-112.50R.
Joubert, Raymond J. M., to S.N.E.C.M.A. Apparatus for rolling and guiding a directable jet nozzle. 4,508,270, Cl. 239-265.350.
Jour, Jean-Paul: *See*—
Aulagner, Michel; and Jour, Jean-Paul, 4,508,205, Cl. 198-334.000.
Joyner, Keith A.; and Foster, Ronald B., to Texas Instruments Incorporated. Process for forming an electrical interconnection system on a semiconductor. 4,507,851, Cl. 29-590.000.
Judson, Philip N.: *See*—
Rowson, Graham P.; Percival, Albert; and Judson, Philip N., 4,508,659, Cl. 260-465.00D.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich, 4,508,394, Cl. 308-3.800.
Jumel, Bernard: *See*—
Herbulot, Jean; and Jumel, Bernard, 4,508,199, Cl. 188-250.00B.
Junggren, Ulf K.; and Sjostrand, Sven E., to Aktiebolaget Hassle. Substituted 2-(benzimidazolyl)pyridines. 4,508,905, Cl. 546-271.000.
Jungverdorben, Hermann-Josef: *See*—
Reinehr, Ulrich; Herbertz, Toni; and Jungverdorben, Hermann-Josef, 4,508,672, Cl. 264-78.000.
Just, Friedrich E.; and Williams, Bolie C., III, to Cameron Iron Works, Inc. Annular blowout preventer. 4,508,311, Cl. 251-1.00B.
Kabele, Dennis F.; and Hauser, Herbert J., Jr., to Deere & Company. Reduced impact piston assembly. 4,508,019, Cl. 92-158.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Sashiki, Takashi; and Sakaeda, Keiko, 4,508,186, Cl. 177-1.000.

Kabushiki Kaisha Ishida Koki Seisakusuo: *See*—
Minamida, Kazukiyo; Haze, Setsuo; and Yamada, Seiji, 4,508,185, Cl. 177-1.000.
Kabushiki Kaisha Kito: *See*—
Maeda, Kazuo, 4,508,318, Cl. 254-350.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Beppu, Kohichi; and Kawakami, Shigezo, 4,508,549, Cl. 55-165.000.
Murakami, Tsudoi; Nasu, Shoji; Tatsumi, Kazuaki; and Nagahama, Yasuhide, 4,508,953, Cl. 219-125.100.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Minami, Teruo, 4,508,388, Cl. 298-22.00C.
Kabushiki Kaisha Meidensha: *See*—
Ohnishi, Kouhei; Ashikaga, Tadashi; and Terashima, Masayuki, 4,509,003, Cl. 318-800.000.
Kabushiki Kaisha Okawara Seisakusho: *See*—
Noguchi, Tetsuo; and Kuwabara, Kanji, 4,508,039, Cl. 110-258.000.
Kabushiki Kaisha Patine Shokai: *See*—
Ohashi, Kazuo, 4,507,880, Cl. 36-115.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Aizawa, Hitomi, 4,508,457, Cl. 368-63.000.
Kabushiki Kaisha Toyoda Jidoh Shokki Seisakusho: *See*—
Yuki, Katsumi; Yoshida, Susumu; Ozeki, Mineo; Miyazaki, Yasuyuki; and Kawamata, Masaru, 4,509,127, Cl. 364-478.000.
Kabushiki Kaisha Universal: *See*—
Okada, Kazuo, 4,508,345, Cl. 273-143.00R.
Kaczur, Jerry J.; Iacoviello, Steven A.; and Miller, Edward G., to Olin Corporation. Process for producing concentrated solutions containing alkali metal chlorates and alkali metal chlorides. 4,508,602, Cl. 204-95.000.
Kadota, Youichi: *See*—
Komurasaki, Satoshi; Ueda, Atsushi; Morimoto, Yoshinobu; and Kadota, Youichi, 4,508,079, Cl. 123-425.000.
Kageyama, Yoichi: *See*—
Onuma, Kazuhiko; Kageyama, Yoichi; Kobayashi, Hiromu; Matsuki, Akihiro; and Suzuki, Makoto, 4,508,841, Cl. 502-73.000.
Kah, Carl L. C., Jr. Anti-syphon flow control valve. 4,508,136, Cl. 137-218.000.
Kaito, Haruyuki: *See*—
Hirose, Etsuro; Takahashi, Kimio; Mori, Toshiro; and Kaito, Haruyuki, 4,507,942, Cl. 68-20.000.
Kajimura, Takashi: *See*—
Umeda, Jun-ichi; Nakashima, Hisao; Kajimura, Takashi; and Kuroda, Takao, 4,509,173, Cl. 372-50.000.
Kakehashi, Yasushi: *See*—
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Kakudai Shosan Kabushiki Kaisha: *See*—
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Kakuta, Takuya: *See*—
Sakata, Gozyo; Numata, Tatsuo; Makino, Kenzi; Kakuta, Takuya; Kusano, Kazuya; Ikai, Takasi; and Oguti, Tosihiko, 4,508,561, Cl. 71-94.000.
Kalbskopf, Reinhard: *See*—
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Kalenik, Stephen P.: *See*—
Eburn, William H., Jr.; and Kalenik, Stephen P., 4,508,142, Cl. 137-625.400.
Kali-Chemie Pharma GmbH: *See*—
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,508,716, Cl. 514-220.000.
Kalokhe, Shivdas A., to Ex-Cell-O Corporation. Adjustable boring tool. 4,508,476, Cl. 408-156.000.
Kamada, Kazumasa; Tamai, Katsumi; Shimomura, Yasunori; and Abe, Kazunori, to Mitsubishi Rayon Co., Ltd. Process for producing a low hygroscopic methacrylic resin and information recording substrates made therefrom. 4,509,163, Cl. 369-284.000.
Kamohara, Toshiyuki: *See*—
Tajima, Shinobu; Umeda, Yasukazu; and Kamohara, Toshiyuki, 4,509,143, Cl. 364-900.000.
Kampner, Karl-Heinz: *See*—
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Kamyr, Inc.: *See*—
Richter, Ole J.; and Funk, Erwin D., 4,508,473, Cl. 406-64.000.
Kan, Frederick S. C.; Li, Kam Wing; and Lau, Kong Ping P., to Wing Tat Electric Mfg. Co. Ltd. Ceiling fan with heating apparatus. 4,508,958, Cl. 219-369.000.
Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille G., to Sanofi. Amino derivatives of pyridazine, and compositions thereof for the central nervous system. 4,508,720, Cl. 514-247.000.
Kanaoka, Takeshi; and Shimizu, Shigehisa, to Fuji Photo Film Co., Ltd. Side printing method and apparatus therefor. 4,508,438, Cl. 354-105.000.
Kanazawa Industries: *See*—
Naya, Masaru; and Ikeda, Tsuneichi, 4,508,023, Cl. 99-279.000.
Kanda, Masahiro; Hatakeyama, Tetsuya; and Morito, Yusuke, to Showa Denko Kabushiki Kaisha. Electromagnetic wave-shielding materials. 4,508,640, Cl. 252-503.000.
Kandler, William C., to Tecumseh Products Company. Economical engine construction having integrally cast muffler. 4,507,917, Cl. 60-323.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Sakata, Yoshio; and Kakehashi, Yasushi, 4,509,031, Cl. 335-306.000.
Takaki, Akira; and Hosoi, Hideki, 4,508,876, Cl. 525-310.000.
Kaneko, Junichi: *See*—
Iwai, Noboru; Hirunuma, Masanori; and Kaneko, Junichi, 4,508,669, Cl. 264-36.000.
Kaneko, Noriaki: *See*—
Joh, Yasushi; Kaneko, Noriaki; and Nagase, Toshio, 4,508,535, Cl. 604-282.000.
Kaneko, Tadashi: *See*—
Takeuchi, Nobuo; Kaneko, Tadashi; Nakazumi, Tadataka; and Yokooku, Katsuhiko, 4,508,078, Cl. 123-399.000.
Kang, Seong S. Disc loading device in a video disc player. 4,509,158, Cl. 369-77.200.
Kaniuk, John A.; Meinking, William E.; and Morris, Jeffrey R., to Allied Corporation. Vibratable refractory mix and binder therefor. 4,508,835, Cl. 501-94.000.
Kano, Hisae: *See*—
Tsumoto, Akio; and Kano, Hisae, 4,508,382, Cl. 296-213.000.
Kantor, Itzhak, to Plasson Maagan Michael Industries Ltd. Tube connection fittings. 4,508,374, Cl. 285-319.000.
Kaplan, Lester J., to Upjohn Company, The. Amine intermediates for analgesic compounds. 4,508,911, Cl. 548-407.000.
Kaplan, Raphael; and Bottka, Nicholas. Method for the deposition of high-quality crystal epitaxial films of iron. 4,508,590, Cl. 156-601.000.
Kapral, Christopher W.; and Cooperman, Michael, to GTE Laboratories Incorporated. Floating node stabilizing circuit for a switched-capacitor circuit and filter. 4,508,982, Cl. 307-572.000.
Karady, Sandor: *See*—
Amato, Joseph S.; Weinstock, Leonard M.; and Karady, Sandor, 4,508,921, Cl. 562-443.000.
Karasek, Keith R.: *See*—
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Kardash, John: *See*—
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Karkanen, Kip M. Work glove finger structure. 4,507,807, Cl. 2-161.00R.
Karkossa, Horst: *See*—
Stopp, Gerhard; Karkossa, Horst; and Trescher, Viktor, 4,508,920, Cl. 562-423.000.
Karlsson, Lars, to Pharos AB. Optical scanning system. 4,508,422, Cl. 350-6.800.
Karol, Frederick J.: *See*—
Beran, Debra L.; Cann, Kevin J.; Jorgensen, Robert J.; Karol, Frederick J.; Maraschin, Norma J.; and Marcinkowsky, Arthur E., 4,508,842, Cl. 502-112.000.
Karpati, Marianna: *See*—
Huhn, Magda; Szabo, Gabor; Dvortsak, Peter; Karpati, Marianna; and Somfai, Eva, 4,508,658, Cl. 260-465.00D.
Karulkar, Pramod C., to Rockwell International Corporation. Method for making a reliable ohmic contact between two layers of integrated circuit metallizations. 4,507,852, Cl. 29-590.000.
Karwacki, Francis A.; and Griffin, Joseph, to United States of America, Navy. Nuclear magnetic resonance gyroscope. 4,509,014, Cl. 324-305.000.
Kasanami, Tohru: *See*—
Senda, Atsuo; Kasanami, Tohru; and Nakagawa, Takuji, 4,508,756, Cl. 427-81.000.
Kashima, Tusnehiro: *See*—
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Kashiwagi, Atumi, to Fujimoto Photo Industrial Co., Ltd. Sheet feeder. 4,508,331, Cl. 271-107.000.
Kasperkovitz, Wolfdietrich G., to U.S. Philips Corporation. Radio receiver comprising a frequency locked loop with audio frequency feedback, and a muting circuit. 4,509,205, Cl. 455-194.000.
Katagiri, Hidenori: *See*—
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,508,682, Cl. 420-590.000.
Katagiri, Masaru: *See*—
Minami, Kenji; Katagiri, Masaru; and Noguchi, Hideo, 4,509,067, Cl. 357-13.000.
Kataoka, Hiroshi, to Kataoka Machine Product Co., Ltd. Apparatus for controlling winding tension. 4,508,284, Cl. 242-75.510.
Kataoka Machine Product Co., Ltd.: *See*—
Kataoka, Hiroshi, 4,508,284, Cl. 242-75.510.
Kato, Hiromi, to Yamaha Hatsudoki Kabushiki Kaisha. Motorcycle. 4,508,189, Cl. 180-219.000.
Kato, Jyoji: *See*—
Yoneda, Naoto; Kato, Jyoji; Hayashi, Kimiaki; Ochiai, Takashi; and Kinashi, Keizo, 4,508,727, Cl. 514-398.000.
Kato, Katsumi: *See*—
Hashimoto, Masao; and Kato, Katsumi, 4,508,459, Cl. 368-276.000.
Katsu, Masutaro: *See*—
Mizuno, Shigeru; Suzuki, Masahiko; Mizuno, Haruki; and Katsu, Masutaro, 4,508,567, Cl. 75-231.000.
Katsuji BABA: *See*—
Watanabe, Kenji, 4,508,064, Cl. 123-1.00A.
Kauder, Otto S.; and Keeley, Charles, to Argus Chemical Corporation. Stabilization of polyvinyl chloride. 4,508,863, Cl. 524-181.000.
Kaufman, Benjamin J.; and Sung, Rodney L., to Texaco Inc. Mannich reaction product and a motor fuel composition containing same. 4,508,541, Cl. 44-71.000.
Kavanagh, Frank J.; Plunkett, James D.; and DePalma, Bernard F., to Doc-K Protective Equipment, Inc. Protective garment. 4,507,801, Cl. 2-2.000.

Kavaya, Michael J., to United States of America, National Aeronautics and Space Administration. Method and apparatus for transfer function simulator for testing complex systems. 4,509,132, Cl. 364-571.000.

Kawaguchi, Hiroshi: *See*—
Hatori, Masami; Ohkuma, Hiroaki; Konishi, Masataka; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,508,647, Cl. 260-239.30T.

Kawaguchi, Munetaka: *See*—
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Kawaguchi, Tadaaki: *See*—
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Kawakami, Hideaki: *See*—
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Kawakami, Shigezo: *See*—
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Kawakami, Tomiko: *See*—
Fujii, Tadashi; Yamaguchi, Tomoyuki; Murakami, Kakuji; Kawakami, Tomiko; and Uenozono, Hiroko, 4,508,570, Cl. 106-20.000.

Kawakubo, Katsuhiko: *See*—
Konotsune, Takuo; and Kawakubo, Katsuhiko, 4,508,910, Cl. 548-367.000.

Kawamata, Masaru: *See*—
Yuki, Katsumi; Yoshida, Susumu; Ozeki, Mineo; Miyazaki, Yasuyuki; and Kawamata, Masaru, 4,509,127, Cl. 364-478.000.

Kawamura, Hiroaki: *See*—
Nemoto, Tadashi; Fukumoto, Ryoichi; Kawamura, Hiroaki; Kondo, Yoshikazu; and Inui, Tsuneo, 4,508,601, Cl. 204-38.500.

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Kawanami, Norihide; Miyake, Yukinori; Kawamura, Kenji; and Toda, Toshiharu, 4,509,090, Cl. 361-119.000.

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Nakato, Hakaru; Sakuraya, Toshikazu; Habu, Yasuhiro; Emi, Toshihiko; Kodama, Masanori; Koshikawa, Takao; Yoshida, Yoshimitsu; and Shimokawa, Fumitaka, 4,508,571, Cl. 106-38.280.

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Sakuta, Masaharu; Kiya, Soichi; Uchizaki, Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, 4,508,572, Cl. 106-90.000.

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KDI American Products, Inc.: *See*—
Spinnett, Raymond G., 4,508,665, Cl. 261-93.000.

Kearney & Trecker Corporation: *See*—
Kielma, Ervin J., 4,507,850, Cl. 29-568.000.

Keeley, Charles: *See*—
Kauder, Otto S.; and Keeley, Charles, 4,508,863, Cl. 524-181.000.

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Keir, Grant G. H.; Peebles, John A.; McNab, Jonas K.; and Campbell, Ian N., to NCR Corporation. Portable container for valuable articles. 4,508,260, Cl. 232-43.100.

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Betts, Edmund D.; and Keith, Jon T., 4,507,825, Cl. 17-73.000.

Keller, Alex J.; and Pinto, Akiva. Method and apparatus for opening fiber bales. 4,507,826, Cl. 19-80.00R.

Kellerman, Anne S.: *See*—
Agnew, Palmer W.; Coviello, John S.; Green, Linda S.; and Kellerman, Anne S., 4,509,122, Cl. 364-200.000.

Kelley, Hugh D. Hydraulic take-up device. 4,508,213, Cl. 198-813.000.

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Kelman, Charles D. Housing for an intraocular lens and method of using the same. 4,508,216, Cl. 206-5.100.

Kelpin, Thomas G., Sr., to Kottothara, Abraham C. Compactor and paddle wheel for aquatic harvester. 4,507,909, Cl. 56-9.000.

Kemlage, Bernard M.: *See*—
Fabricius, Karen A.; and Kemlage, Bernard M., 4,508,757, Cl. 427-93.000.

Kemmerer, Kermit H., Jr. Computer read-out book stand. 4,508,306, Cl. 248-454.000.

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Kennedy, James A., to William L. Bonnell Company, The. Scrap metal reclaiming process. 4,508,564, Cl. 75-65.00R.

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Joseph, Claude, 4,508,364, Cl. 280-821.000.

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Roach, Jack W., 4,508,597, Cl. 203-79.000.

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Kesten, Martin, to Preston Engravers, Inc. Device for transferring and monitoring load to die roll. 4,507,996, Cl. 83-344.000.

Kettlewell, Peter J.: *See*—
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Key Pharmaceuticals, Inc.: *See*—
Hsiao, Charles H., 4,508,702, Cl. 424-19.000.

Keyes, Marion A.; and Thompson, William L., to Babcock & Wilcox Company, The. Correlation type flicker flamon. 4,509,041, Cl. 340-578.000.

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Lange, Arno; Kiehs, Karl; and Adolphi, Heinrich, 4,508,734, Cl. 514-594.000.

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Kienzle Apparate GmbH: *See*—
Donner, Bernd; and Siefert, Roland, 4,507,963, Cl. 73-431.000.

Kiess, Ronald J.; and Nichols, Gary R., to Magnavox Government and Industrial Electronics Company. Magnetic sensor for distributorless ignition system and position sensing. 4,508,092, Cl. 123-617.000.

Killilea, Daniel E., to Republic Steel Corporation. Apparatus for cooling a hot-rolled product. 4,507,949, Cl. 72-201.000.

Kim, Chong Y.; Farver, Terry F.; and Brewer, Jack W., to Miles Laboratories, Inc. Method for the separation of extracellular amylase and protease produced during the fermentation of enzyme producing microorganisms. 4,508,825, Cl. 435-201.000.

Kimberly-Clark Corporation: *See*—
Whitehead, Howard A., 4,508,531, Cl. 604-14.000.

Kimoto, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical disk apparatus. 4,509,154, Cl. 369-33.000.

Kimpel, Rolf-Dieter; Rauterberg, Ulf; and Tamm, Horst, to Siemens Aktiengesellschaft. Polarized electromagnetic relay. 4,509,025, Cl. 335-85.000.

Kimura, Etsuji; Ogi, Katsumi; and Sato, Kazusuke, to Mitsubishi Kinzoku Kabushiki Kaisha. Apparatus for preparing high melting point high toughness metals. 4,508,322, Cl. 266-149.000.

Kinashi, Keizo: *See*—
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King Design, Inc.: *See*—
Robinson, Larry G.; and King, Edward C., 4,507,888, Cl. 40-621.000.

King, Edward C.: *See*—
Robinson, Larry G.; and King, Edward C., 4,507,888, Cl. 40-621.000.

Kingery, William L. Full-wave rectification of signals generated by radio frequency transmitting circuits. 4,509,202, Cl. 455-108.000.

Kinnard, Wolcott S. Album assembly. 4,507,885, Cl. 40-405.000.

Kioritz Corporation: *See*—
Inaga, Hisashi; and Ohtagawa, Kozi, 4,507,865, Cl. 30-276.000.

Kirby, Raymond L., Jr.: *See*—
Ivary, David J.; and Kirby, Raymond L., Jr., 4,508,252, Cl. 226-44.000.

Kirschenlohr, Werner: *See*—
Mueller, Josef; Wiersdorff, Walter-Wielant; Kirschenlohr, Werner; and Schwantje, Gerd, 4,508,924, Cl. 568-322.000.

Kishi, Norimasa: *See*—
Morimoto, Yoshiro; and Kishi, Norimasa, 4,507,985, Cl. 74-866.000.

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Hasegawa, Shumpei; and Kishi, Noriyuki, 4,508,088, Cl. 123-493.000.

Kishida, Kazuo; Hasegawa, Akira; and Sugimori, Masahiro, to Mitsubishi Rayon Co., Ltd. Multi-layer structure polymer composition. 4,508,875, Cl. 525-308.000.

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Ohno, Shigeru; and Kishimoto, Shinzo, 4,508,817, Cl. 430-393.000.

Kiss, Gabor D., to Celanese Corporation. Energy storage flywheel using liquid crystalline polymer tape. 4,507,983, Cl. 74-572.000.

Kitagishi, Nozomu; and Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Telephoto objective. 4,508,433, Cl. 350-454.000.

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Okamura, Kenji; Nagaishi, Hatsuo; Kitahara, Tsuyoshi; Sone, Kohki; and Nakamura, Koyo, 4,507,986, Cl. 74-866.000.

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Sakuta, Masaharu; Kiya, Soichi; Uchizaki, Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, 4,508,572, Cl. 106-90.000.

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Elmis, Herbert; and Klar, Adrian, 4,509,072, Cl. 358-17.000.

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Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,508,926, Cl. 568-766.000.

Klein, Yosef: *See*—
Robin, Seymour; and Klein, Yosef, 4,509,053, Cl. 343-708.000.

Klempke, William D.: *See*—
Vieau, Robert G.; and Klempke, William D., 4,507,897, Cl. 51-209.00R.

Klenk, Emil; and Heina, Karl-Fritz, to Maschinenbau Oppenweiler Binder GmbH & Co. Tightening means for at least one presser belt associated with a tail pulley of a continuous sheet feeder. 4,508,214, Cl. 198-833.000.

Klimpert, Randall J.; and Meyer, Burton C., to Marvin Glass & Associates. Impact responsive toy. 4,508,521, Cl. 446-486.000.

Klober, Martin, to Diehl GmbH & Co. Incendiary mixture constituted of metals. 4,508,580, Cl. 149-19.910.

Klockner-Humboldt-Deutz AG: *See*—
Ramesohl, Hubert; Seelen, Fritz; Filges, Ralf; Schroder, Karlheinz; and Veiser, Elmar, 4,508,503, Cl. 432-109.000.

Klueber, Wilhelm, to Hilti Aktiengesellschaft. Cylindrical guide member for an impacting mechanism in a hammer drill. 4,508,180, Cl. 173-104.000.

Kluth, Hermann; and Meffert, Alfred, to Henkel Kommanditgesellschaft. Polyurethane prepolymers based on oleochemical polyols. 4,508,853, Cl. 521-107.000.

Knapp, Anthony W.: *See*—
Shepler, Eric F.; and Knapp, Anthony W., 4,508,408, Cl. 339-89.00M.

Knappworst, Jurgen: *See* —
Jensen, Ernst; Knappworst, Jurgen; and Stahlmann, Rudolf, 4,508,036, Cl. 102-444.000.

Knoedler, Reinhard; Nelson, Paul A.; Shimotake, Hiroshi; and Battles, James E., to United States of America, Energy. Hermetically sealed electrical feedthrough for high temperature secondary cells. 4,508,797, Cl. 429-184.000.

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Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,508,481, Cl. 413-1.000.

Kochanek, George E.: *See*—
Barr, Rodney E.; and Kochanek, George E., 4,507,973, Cl. 73-724.000.

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Nakato, Hakaru; Sakuraya, Toshikazu; Habu, Yasuhiro; Emi, Toshihiko; Kodama, Masanori; Koshikawa, Takao; Yoshida, Yoshimitsu; and Shimokawa, Fumitaka, 4,508,571, Cl. 106-38.280.

Koehl, Richard: *See*—
Lerman, Michael J.; Koehl, Richard; Chiarella, Anthony A.; and Zamory, William, 4,508,455, Cl. 366-247.000.

Koehler Manufacturing Company: *See*—
Guimond, Roy A.; Gulliksen, John E.; and Reed, Nanci W., 4,508,801, Cl. 429-238.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Bolza-Schunemann, Claus A., 4,508,034, Cl. 101-365.000.

Kohl, Charles F., to Dow Corning Corporation. Method and novel catalyst compositions for preparing polyorganosiloxanes. 4,508,887, Cl. 528-21.000.

Kohler Co.: *See*—
Bolgert, Edwin F., 4,508,137, Cl. 137-218.000.

Kohn, Elliott S., to RCA Corporation. Television receiver adaptable for descrambler module. 4,509,210, Cl. 455-349.000.

Kohn, Gustave K.: *See*—
Bamberg, Joe T.; and Kohn, Gustave K., 4,508,906, Cl. 546-300.000.

Kohyama, Mitsuaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Developing device. 4,508,052, Cl. 118-651.000.

Koike, Akihiko: *See*—
Yamato, Akihiro; and Koike, Akihiko, 4,508,084, Cl. 123-492.000.

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Ohara, Shunji; Yoshida, Tomio; Satoh, Isao; and Koishi, Kenji, 4,509,156, Cl. 369-54.000.

Kojima, Satoru, to Coret & Company, Ltd.; and Machine Engineering Co., Ltd. Vice for fishhook. 4,508,328, Cl. 269-236.000.

Kojima, Seiji: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,509,064, Cl. 346-207.000.

Kollman, Garald E., to Rohm and Haas Company. Herbicidal compositions. 4,508,559, Cl. 71-83.000.

Kollmorgen Technologies Corporation: *See*—
Reiss, Leon G.; and Schultz, Roy D., 4,508,988, Cl. 310-154.000.

Kolm, Eric A.: *See*—
Kolm, Henry H.; and Kolm, Eric A., 4,508,994, Cl. 315-200.00R.

Kolm, Henry H.; and Kolm, Eric A., to Piezo Electric Products, Inc. Heat-sensitive variable-resistance light socket insert. 4,508,994, Cl. 315-200.00R.

Kolodzey, Wolfgang: *See*—
Langhoff, Joseph; Althoff, Erwin; Kolodzey, Wolfgang; and Gerhardus, Ulrich, 4,508,542, Cl. 48-77.000.

Kolt, Stanley, to Suroff, Leonard W., a part interest. Thermostatic assembly. 4,507,922, Cl. 60-531.000.

Kolta, Rezso: *See*—
Fogassy, Elemer; Toke, Laszlo ; Faigl, Ferenc; Soos, Rudolf; Bozzay, Jozsef; Kolta, Rezso; Nemes, Jozsef; and Bencsik, Peter, 4,508,919, Cl. 562-401.000.

Komatsu, Akihiro: *See*—
Yashima, Michio; Komatsu, Akihiro; Takanashi, Masami; Hirose, Masashi; and Nakayama, Kengo, 4,508,944, Cl. 200-61.850.

Komura, Makoto: *See*—
Masuda, Isao; Nishikawa, Kazunori; Iwasaki, Yoshiki; and Komura, Makoto, 4,509,155, Cl. 369-48.000.

Komurasaki, Satoshi; Ueda, Atsushi; Morimoto, Yoshinobu; and Kadota, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Knocking control system for internal combustion engine. 4,508,079, Cl. 123-425.000.

Kondo, Yoshikazu: *See*—
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Konishi, Masataka: *See*—
Hatori, Masami; Ohkuma, Hiroaki; Konishi, Masataka; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,508,647, Cl. 260-239.30T.

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Koomey Blowout Preventers, Inc.: *See*—
Jones, Marvin R., 4,508,313, Cl. 251-1.00A.

Kornely, Edward B.; and Paul, Gerald T., to Newell Companies, Inc. Protective liner for vessels. 4,508,768, Cl. 428-35.000.

Korowitz, Simon, to General Signal Corporation. Communications network access rights arbitration. 4,509,117, Cl. 364-200.000.

Kosch, Delmar D. Welding wire dispenser. 4,508,291, Cl. 242-156.200.

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Sano, Shigehisa; Seto, Isao; Koseki, Hiroyuki; and Minomura, Mana, 4,508,152, Cl. 152-356.00R.

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Nakato, Hakaru; Sakuraya, Toshikazu; Habu, Yasuhiro; Emi, Toshihiko; Kodama, Masanori; Koshikawa, Takao; Yoshida, Yoshimitsu; and Shimokawa, Fumitaka, 4,508,571, Cl. 106-38.280.

Kotchy, Alan W. Flashlight holder. 4,508,249, Cl. 224-219.000.

Kottothara, Abraham C.: *See*—
Kelpin, Thomas G., Sr., 4,507,909, Cl. 56-9.000.

Kovach, Stephen M.: *See*—
Zandona, Oliver J.; Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., 4,508,839, Cl. 502-65.000.

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Boie, Immo; Luhrig, Hermann; and Kovacic, Guido, 4,508,809, Cl. 430-237.000.

Kowalik, Ralph M.; Duvdevani, Ilan; Peiffer, Dennis G.; and Lundberg, Robert D., to Exxon Research & Engineering Co. Drag reduction agent for hydrocarbon liquid. 4,508,128, Cl. 137-13.000.

Kowalski, Ronald C., to Exxon Research & Engineering Co. Elastomer extrusion drying with gas injection. 4,508,592, Cl. 159-2.100.

Koyama, Takahiro; Matsumura, Haruo; and Morita, Teturo, to Daicel Chemical Industries Ltd.; and Nichirin Chemical Industries Ltd. Process for the preparation of a powdery calcium cellulose glycolate. 4,508,893, Cl. 536-85.000.

Koyama, Toshihiro; Anbe, Yoshiharu; and Funahashi, Takuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and system for controlling an interstand tension in a continuous rolling mill. 4,507,946, Cl. 72-17.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Peter, Siegfried, 4,508,543, Cl. 48-197.00R.

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Bowen, James B.; and Kramer, Charles F., 4,508,145, Cl. 139-92.000.

Krasnjanski, David, to United States of America, Navy. Geomagnetic velocimeter. 4,509,131, Cl. 364-565.000.

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Kremski, Jacob. Bumper rail cover and method of installing the same. 4,508,338, Cl. 273-9.000.

Kreuz, Alois: *See*—
Hufnagel, Walter; and Kreuz, Alois, 4,507,960, Cl. 73-187.000.

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Voetter, Heinz; Darton, Richard C.; Van Meurs, Hubrecht C. A.; and Krishna, Rajamani, 4,508,041, Cl. 110-347.000.

Krogh, Kris K. Spinner device. 4,508,344, Cl. 273-141.00R.

Kroll, Robert E., to Oxo Welding Equipment Co., Inc. Portable arc voltage wirefeed welding system. 4,508,954, Cl. 219-132.000.

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Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,508,834, Cl. 501-73.000.

Kroner, Klaus, to U.S. Philips Corporation. Circuit arrangement for generating the vertical synchronizing information in a magnetic video tape apparatus. 4,509,082, Cl. 360-37.100.

Kruger, Albert J., Jr.; and Johnson, John K., to Coca Cola Company, The. Beverage clouding agent based on carnauba wax. 4,508,744, Cl. 426-590.000.

Kruse, Lyle W., to United States of America, Energy. Portal radiation monitor. 4,509,042, Cl. 340-600.000.

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Kubo, Tatsuki: *See*—
Inoue, Akira; Takase, Shinji; Sekido, Yasuo; Mori, Masao; and Kubo, Tatsuki, 4,508,849, Cl. 502-263.000.

Kuck, Mark A.: *See*—
Michel, Christian G.; Schachter, Rozalie; Kuck, Mark A.; Baumann, John A.; and Raccah, Paul M., 4,508,931, Cl. 136-255.000.

Kudelski, S.A.: *See*—
Kudelski, Stefan, 4,508,292, Cl. 242-190.000.

Kudelski, Stefan, to Ampex Corp.; and Kudelski, S.A. Tape loop sensing arm and tape guide for magnetic tape recording and playback machines. 4,508,292, Cl. 242-190.000.

Kudoh, Toshio: *See*—
Kusui, Akio; Morita, Shuji; Kudoh, Toshio; Tanaka, Yasuo; and Itoh, Hirotaka, 4,508,414, Cl. 339-143.00R.

Kudoh, Yasuo: *See*—
Takeda, Takeshi; Machida, Yasuhiko; Kudoh, Yasuo; and Ikegaya, Kazutoshi, 4,508,632, Cl. 252-70.000.

Kugimiya, Youichi: *See*—
Ishibashi, Tadao; and Kugimiya, Youichi, 4,508,786, Cl. 428-461.000.

Kuhn, Friedhelm, to Ruhrgas Aktiengesellschaft. Method of monitoring furnace installations. 4,508,501, Cl. 431-2.000.

Kukowski, John A.; Soth, Henry J.; and Gay, William H., to Universal Instruments Corporation. Method and apparatus for high speed transfer and insertion of electrical components. 4,507,862, Cl. 29-837.000.

Kulesza, Ralph J., to Marvin Glass & Associates. Pivotably linked toy vehicles, one self-propelled. 4,508,517, Cl. 446-464.000.

Kumagai, Tadanobu: *See*—
Numazawa, Akio; Sakai, Ichio; Kumagai, Tadanobu; and Nishikawa, Seiichi, 4,508,522, Cl. 464-11.000.

Kumakawa, Akinaga: *See*—
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, 4,508,680, Cl. 419-5.000.

Kumasaka, Hideo; and Fujisawa, Kazuo, to Toyo Seikan Kaisha, Ltd. Sealing compound for cans. 4,508,569, Cl. 106-14.120.

Kumata, Masao; and Matsuoka, Noriaki, to Sanyo Electric Co., Ltd. Air-cooled fuel cell system. 4,508,793, Cl. 429-26.000.

Kuna, Wayne A.: *See*—
Meyer, Steven M.; Kuna, Wayne A.; Morrison, Robert S.; Morrison, Howard J.; Ditton, Richard A.; and Ditton, Elaine A., 4,508,353, Cl. 273-313.000.

Kuo, Han C.: *See*—
Gopikanth, Mysore L.; Kuo, Han C.; and Bowden, William L., 4,508,798, Cl. 429-196.000.
Gopikanth, Mysore L.; and Kuo, Han C., 4,508,799, Cl. 429-196.000.
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Kupper, Wilhelm, to W. Schlafhorst & Co. Cop preparation plant. 4,508,227, Cl. 209-927.000.

Kurandt, Hans-Friedrich; and Kampner, Karl-Heinz, to Chemische Werke Huls Ag. Process for improving the fluidity and conveyability of moist calcium sulfate precipitates 4,508,574, Cl. 106-109.000.

Kurashima, Hideo: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,508,481, Cl. 413-1.000.

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Kuroda, Kazuo, to Pioneer Video Corporation. Dropout compensation circuit. 4,509,078, Cl. 358-160.000.

Kuroda, Masayuki: *See*—
Saito, Eiji; Aizawa, Shoji; Mitsui, Michio; Miyata, Tomohiko; and Kuroda, Masayuki, 4,508,266, Cl. 239-3.000.

Kuroda, Takao: *See*—
Umeda, Jun-ichi; Nakashima, Hisao; Kajimura, Takashi; and Kuroda, Takao, 4,509,173, Cl. 372-50.000.

Kusakawa, Yukio; Nakamura, Toshiaki; Ina, Yoshifumi; and Inbe, Takashi, to Nippondenso Co., Ltd. Motor driven fuel pump. 4,508,492, Cl. 417-366.000.

Kusano, Kazuya: *See*—
Sakata, Gozyo; Numata, Tatsuo; Makino, Kenzi; Kakuta, Takuya; Kusano, Kazuya; Ikai, Takasi; and Oguti, Tosihiko, 4,508,561, Cl. 71-94.000.

Kusui, Akio; Morita, Shuji; Kudoh, Toshio; Tanaka, Yasuo; and Itoh, Hirotaka, to Dainichi-Nippon Cables, Ltd. Shielded cable-connector assembly. 4,508,414, Cl. 339-143.00R.

Kuwabara, Kanji: *See*—
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Kuykendall, John: *See*—
Alexandrovich, George; Edinger, J. Raymond; Hofer, Alan; and Kuykendall, John, 4,509,159, Cl. 369-170.000.

Kyoto Ceramic Co., Ltd.: *See*—
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Labartino, Joseph: *See*—
Bruel, Michel; Escaron, Jean; and Labartino, Joseph, 4,508,056, Cl. 118-730.000.

Lacefield, William B.; and Lindstrom, Terry D., to Eli Lilly and Company. Anti-arrhythmic N-alkanoylaminoalkyl fluorenes. 4,508,735, Cl. 514-616.000.

Lack, Larry H., to Auer, Frank M.; Auer, C. J.; and Lindenmayer, Paul B. Ratchet wrench. 4,507,990, Cl. 81-57.390.

Lackey, Stanley A.; Meinerth, Kim A.; and Stoner, David A., to Digital Equipment Corporation. Special instruction processing unit for data processing system. 4,509,116, Cl. 364-200.000.

Lacour, Bernard; Maillet, Marc; Vannier, Chantal; and de Witte, Olivier, to Compagnie Generale d'Electricite. Capacitor discharge excited gas laser. 4,509,174, Cl. 372-82.000.

Lacroix, Alain: *See*—
Dubois, Jean; Lacroix, Alain; Forestier, Lucienne; and Steiner, Jean-Pierre, 4,507,812, Cl. 4-228.000.

Lades, Hans; Fink, Friedrich; Liebel, Siegfried; Lauterbach, Inge; Taube, Thomas; and Zollner, Dieter, to Arc Technologies Systems Ltd. Arrangement of an electrode for electric arc furnaces. 4,509,178, Cl. 373-93.000.

Ladusaw, William T., to General Electric Company. Hermetic compressor including a terminal block and thermal protection retainer means. 4,508,987, Cl. 310-68.00C.

Ladwig, Lee R.: *See*—
Olig, Eugene A.; and Ladwig, Lee R., 4,509,126, Cl. 364-474.000.

Lagoni, William A.; and Harlan, Wayne E., to RCA Corporation. Video signal peaking system. 4,509,080, Cl. 358-166.000.

Lambert, James L., to Westinghouse Electric Corp. Distributed fiber optic temperature monitoring apparatus and method. 4,508,461, Cl. 374-161.000.

Lambert, Johnny H.; Primat, Didier; Edmiston, William H.; Edmiston, Johnny J.; and Edmiston, James H., to Primlumber, Inc. Firewood sawing apparatus. 4,507,998, Cl. 83-419.000.

Lampson, Neil F., to Riggers Manufacturing Co. Counterbalanced crane structure. 4,508,232, Cl. 212-178.000.

Landis, Donald H., to Epic Metals Corporation. Electrical distribution for metal deck construction. 4,507,900, Cl. 52-221.000.

Lange, Arno; Kiehs, Karl; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Substituted N-benzoyl-N-phenoxyphenylureas, the manufacture, and the use thereof for combating insects. 4,508,734, Cl. 514-594.000.

Langhoff, Joseph; Althoff, Erwin; Kolodzey, Wolfgang; and Gerhardus, Ulrich. Slag separator for a coal gasification installation. 4,508,542, Cl. 48-77.000.

Lankard, John R., Sr.: *See*—
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Lapautre, Michel A.: *See*—
Schlegel, Raymond F.; Bourassin, Rene P.; and Lapautre, Michel A., 4,508,530, Cl. 494-49.000.

Lapointe, Wildy. Animated puzzle block game. 4,508,348, Cl. 273-157.00R.

Lapple, Arnulf R.: *See*—
Erzinger, Paul; and Lapple, Arnulf R., 4,508,536, Cl. 8-639.000.

Laroche, Michel C. F.: *See*—
Cattaneo, Christian J.; Derouet, Patrick R. J.; and Laroche, Michel C. F., 4,508,295, Cl. 244-134.00A.

Larrauri, Jose M.; Arias, Beairit C.; and Galiasso, Roberto E., to Intevep, S.A. Hydrocracking with treated bauxite or laterite. 4,508,616, Cl. 208-111.000.

Larson, Allan B.: *See*—
Trechsel, Hans W.; Larson, Allan B.; and Ryerse, John A., 4,508,148, Cl. 141-147.000.

Lau, Kong Ping P.: *See*—
Kan, Frederick S. C.; Li, Kam Wing; and Lau, Kong Ping P., 4,508,958, Cl. 219-369.000.

Laubie, Michel: *See*—
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Launie, Kenneth J., to Polaroid Corporation. Film counter. 4,508,441, Cl. 354-217.000.

Lauterbach, Inge: *See*—
Lades, Hans; Fink, Friedrich; Liebel, Siegfried; Lauterbach, Inge; Taube, Thomas; and Zollner, Dieter, 4,509,178, Cl. 373-93.000.

Law, Kock-Yee; and Bailey, Frank C., to Xerox Corporation. Photoconductive devices containing novel benzyl fluorinated squaraine compositions. 4,508,803, Cl. 430-59.000.

Lawson, Lonnie B., Jr.: *See*—
Berfield, Robert C.; Crevling, Robert L., Jr.; and Lawson, Lonnie B., Jr., 4,508,550, Cl. 55-216.000.

Lawson, Robert; Augustus, Jimmie R.; Corless, Robert; and Kardash, John, to Comdial Technology Corporation. Last number redial device. 4,508,939, Cl. 179-90.00B.

Lawson, William J.; and Gunter, William L. Toilet seat and lid lock. 4,507,813, Cl. 4-253.000.

Lazarre, Flavien, to Societe Nationale Elf Aquitaine. Moving piston with self-tightening sealing ring. 4,508,354, Cl. 277-27.000.

Le Joint Francais: *See*—
Pages, Gerard, 4,508,004, Cl. 84-385.00P.

Lear Siegler, Inc.: *See*—
Whitman, Bruce, 4,508,209, Cl. 198-583.000.

Leary, William: *See*—
Mlinaric, Jerry; Leary, William; and Mummery, Robert J., 4,508,485, Cl. 414-458.000.

Leathers, Joel F. M.; and Calvin, Donald W., to Dow Chemical Company, The. Recovery of fumed SiO_2. 4,508,538, Cl. 23-313.00R.

LeBlond, Charles E.; and LeBlond, Henri, to Hamelin Industries, Inc. Wheel hub including structure for attachment of accessories. 4,508,392, Cl. 301-63.0PW.
LeBlond, Henri: *See*—
LeBlond, Charles E.; and LeBlond, Henri, 4,508,392, Cl. 301-63.0PW.
Lecharpy, Joel: *See*—
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Lee, Andrew L.: *See*—
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Lee, Do I.: *See*—
Keskey, William H.; Schuetz, James E.; and Lee, Do I., 4,508,869, Cl. 524-808.000.
Lee, Ivan S., to Polysar Limited. Pressure sensitive adhesives. 4,508,864, Cl. 524-187.000.
Lee, Lian-Tze: *See*—
Chang, Ching-Te; Lee, Lian-Tze; and Su, Hsueh-Ling, 4,508,654, Cl. 260-429.00R.
Lee, Wai-Hon; and Voisin, Paul H., to Xidex Corporation. Method of using diazotype photographic materials with preexposure treatment to form uniform sites of refractive index change. 4,508,808, Cl. 430-146.000.
le Faou, Daniel: *See*—
Beyl, Jean; Bernard, Jean; Guerreau, Rene ; le Faou, Daniel; and Peyre, Henri, 4,508,360, Cl. 280-605.000.
Leibowitz, Martin N. Cutting shears. 4,507,864, Cl. 30-248.000.
Leicht, John R.: *See*—
Sohl, Gordon; Ort, Donald L.; and Leicht, John R., 4,509,057, Cl. 346-1.100.
Leininger, Joel C.; Moore, Victor S.; and Stahl, William L., Jr., to International Business Machines Corporation. Microword control mechanism utilizing a programmable logic array and a sequence counter. 4,509,114, Cl. 364-200.000.
Leirnes, Johan S.; Lundstrom, Malkolm S.; Hedlund, Martin L.; and Buren, Kurt J. A., to Boliden Aktiebolag. Method for producing lead from oxidic lead raw materials which contain sulphur. 4,508,565, Cl. 75-77.000.
Leistner, Herbert E., to Sigma Tool & Machine Limited. Tee nut fastener member. 4,508,478, Cl. 411-176.000.
Leland Stanford Jr. University, The Board of Trustees of the: *See*—
Yelderman, Mark L., 4,507,974, Cl. 73-861.060.
Lemke, Stuart H. Apparatus for installing fasteners. 4,507,991, Cl. 81-463.000.
Lemons, Ross A.: *See*—
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Lenser Verwaltungs-GmbH: *See*—
Heckl, Franz; and Herget, Herbert, 4,508,623, Cl. 220-229.000.
Lerman, Michael J.; Koehl, Richard; Chiarella, Anthony A.; and Zamory, William, to De Dietrich (USA), Inc. Agitator including impeller assembly and shaft having interference fit. 4,508,455, Cl. 366-247.000.
Lesieur-Cotelle: *See*—
Dubois, Jean; Lacroix, Alain; Forestier, Lucienne; and Steiner, Jean-Pierre, 4,507,812, Cl. 4-228.000.
Lester, James M.; Reinker, Richard P.; and Regenbrecht, Douglas E., to Ball Corporation. Solid subliming cooler with radiatively-cooled vent line. 4,507,941, Cl. 62-514.00R.
Letoffe, Michel; Favre, Roger; and Perrin, Patrice, to Rhone-Poulenc Specialites Chimiques. Rapidly hardening organopolysiloxane compositions comprising polyacyloxysilane cross-linking agents. 4,508,888, Cl. 528-23.000.
Leu, Willy, to Ferag Ag. Drive means for the shaft of a mobile apparatus. 4,508,523, Cl. 474-115.000.
Lever Brothers Company: *See*—
Chaudhuri, Dwaipayan; and Stebles, Malcolm R., 4,508,705, Cl. 424-47.000.
Clarke, David E., 4,508,635, Cl. 252-174.230.
Levesque, Adelard, Jr.; and Rembold, John P., to United Technologies Corporation. Method and apparatus for detecting failures in a control system. 4,509,110, Cl. 364-153.000.
Leviton Manufacturing Company, Inc.: *See*—
Bienwald, F. Wolfgang, 4,508,417, Cl. 339-176.00L.
Lewis, Bernard L., to United States of America, Navy. Phase-coded pulse expander-compressor. 4,509,051, Cl. 343-17.2PC.
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LGZ Landis & Gyr Zug AG: *See*—
Neyer, Norbert, 4,509,180, Cl. 375-76.000.
Li, George S.: *See*—
Giffen, William M., Jr.; Li, George S.; and Miller, Arthur F., 4,508,787, Cl. 428-473.500.
Li, Kam Wing: *See*—
Kan, Frederick S. C.; Li, Kam Wing; and Lau, Kong Ping P., 4,508,958, Cl. 219-369.000.
Liao, Leon. Batting aid with pivotally supported ball. 4,508,340, Cl. 273-26.00E.
Liebel, Siegfried: *See*—
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Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, to Kali-Chemie Pharma GmbH. [1,2]-Fused 1,4-benzodiazepine compounds, process for their preparation and compositions containing them. 4,508,716, Cl. 514-220.000.
Lin, Shi-Tron. Method for determining the characteristic behavior of a metal-insulator-semiconductor device in a deep depletion mode. 4,509,012, Cl. 324-158.00D.
Lin, Weihwang. Hydraulic cylinder. 4,508,015, Cl. 92-2.000.
Lindall, Arnold W.; and Elting, James J., to Immuno Nuclear Corporation. Bioassay of parathyroid hormone. 4,508,828, Cl. 436-500.000.
Lindenmayer, Paul B.: *See*—
Lack, Larry H., 4,507,990, Cl. 81-57.390.
Lindenmuth, William T.: *See*—
Conn, Andrew F.; Lindenmuth, William T.; and Frederick, Gary S., 4,508,577, Cl. 134-1.000.
Lindstrom, Terry D.: *See*—
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Lipscomb, David M.: *See*—
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Litt, Frederic A.; and Czernicki, Thomas R., to Elco Corporation, The. Oil soluble sulfur free oxymolybdenum organic compounds having friction reducing antiwear properties in lubricant compositions, process of manufacture, and lubricant compositions. 4,508,630, Cl. 252-32.500.
Littelfuse, Inc.: *See*—
Daggett, Charles W., 4,508,412, Cl. 339-126.00R.
Littmann, Wolfgang. Method of increasing the yield of hydrocarbons from a subterranean formation. 4,508,170, Cl. 166-272.000.
Livorsi, Carl F.; Wucik, Joseph A., Jr.; Dorrian, Philip J.; and Struzik, Lawrence F., to Edison International Inc. Bidirectional valve seal. 4,508,315, Cl. 251-173.000.
Llewellyn, Link W., to Chi Rho Corporation. Eye-hand coordinator. 4,508,339, Cl. 273-26.00E.
Loeppert, Peter V.: *See*—
Busta, Heinz H.; Tsao, Kuey-Yeou; White, Wayne D.; and Loeppert, Peter V., 4,508,613, Cl. 204-418.000.
LoFaso, Joseph S.; LoFaso, Mardi I.; and Gold, Kenneth R. Beverage receptacle opener. 4,507,988, Cl. 81-3.090.
LoFaso, Mardi I.: *See*—
LoFaso, Joseph S.; LoFaso, Mardi I.; and Gold, Kenneth R., 4,507,988, Cl. 81-3.090.
Logan Industries & Services, Inc.: *See*—
Pikna, Richard G., 4,508,488, Cl. 417-12.000.
Lone Star Steel Company: *See*—
Patterson, Billy R.; and Schneider, Warren P., 4,508,375, Cl. 285-334.000.
Long, Florren E., to Ludlow Corporation. Window bag for liquids. 4,509,197, Cl. 383-106.000.
Long, Jerry M.; and Womack, James A., to Innovative Concepts, Inc. Storage container and display device. 4,508,217, Cl. 206-45.180.
Looker, Robert. Light weight tensionable buckle. 4,507,829, Cl. 24-68.0CD.
Loram Maintenance of Way, Inc.: *See*—
Vieau, Robert G.; and Klempke, William D., 4,507,897, Cl. 51-209.00R.
Lorch, Daniel L., to United States of America, Navy. Air bag restraint system. 4,508,294, Cl. 244-122.0AG.
Lorenz, Hans-Peter: *See*—
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Lorenz, Horst; and Schulte, Richard, to Th. Kieserling & Albrecht. Apparatus for manufacturing wheel rim blanks. 4,508,255, Cl. 228-5.100.
Lorenz, Kurt: *See*—
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, 4,508,596, Cl. 202-227.000.
Lorimer, D'Arcy H.; and Handy, Christopher C., Jr., to AT&T Technologies, Inc. Method of regenerating acetate in a metal removal process. 4,508,688, Cl. 423-92.000.
Loubier, Robert J. Dental floss applicator. 4,508,125, Cl. 132-92.00R.
Low, Robert N.; Cloutier, Frank L.; and Siewell, Gary, to Hewlett-Packard Company. Ink reservoir with essentially constant negative back pressure. 4,509,062, Cl. 346-140.00R.
Lubov, Michael: *See*—
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Lucas Industries: *See*—
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Harrison, Anthony W., 4,508,140, Cl. 137-501.000.
Howes, Peter, 4,508,489, Cl. 417-221.000.
Reynolds, Desmond H. J.; and Taft, Phillip A., 4,508,012, Cl. 91-512.000.
Lucas, Jean-Claude. Device for the formation of a joint for an industrial type flooring. 4,507,902, Cl. 52-370.000.
Ludlow Corporation: *See*—
Long, Florren E., 4,509,197, Cl. 383-106.000.
Luetzelschwab, Wayne E., to Marathon Oil Company. Apparatus and method for preparing polymer solutions. 4,508,858, Cl. 523-313.000.
Luginbuhl, Pierre; Parniere, Alain; and Argintaru, Lazare, to Thomson-CSF. Satellite telecommunications system. 4,509,200, Cl. 455-12.000.
Luhrig, Hermann: *See*—
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Luhrsen, Ernst; Pohl, Siegfried; and Plath, Jurgen, to Didier-Werke AG. Fastening means for a closure plate on a sliding shutter outlet in a vessel which contains molten metal. 4,508,324, Cl. 266-236.000.

Lukon, Fabrik fur elektrothermische Apparate und elektrische Stabheizkorper, Paul Luscher, Tauffelen: *See*—
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Lundahl, E. Cordell: *See*—
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Lundberg, Robert D.: *See*—
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Lundstrom, Malkolm S.: *See*—
Leirnes, Johan S.; Lundstrom, Malkolm S.; Hedlund, Martin L.; and Buren, Kurt J. A., 4,508,565, Cl. 75-77.000.

Luscher, Paul, to Lukon, Fabrik fur elektrothermische Apparate und elektrische Stabheizkorper, Paul Luscher, Tauffelen. Apparatus for heating stackable dishes. 4,508,959, Cl. 219-385.000.

Lustig, Claude D., to Sperry Corporation. Low cost addressing system for AC plasma panels. 4,509,045, Cl. 340-794.000.

Lyons, Robert F.: *See*—
Schlesch, Ronald D.; and Lyons, Robert F., 4,508,135, Cl. 137-185.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg AG: *See*—
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M.A.N.-Roland Druckmaschinen Aktiengeselischaft: *See*—
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Maag Gear-Wheel & Machine Company Limited: *See*—
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Maass, Donald A.: *See*—
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Machida, Yasuhiko: *See*—
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Machine Engineering Co., Ltd.: *See*—
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Machova, Alena: *See*—
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Mackay, Donald A. M.: *See*—
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MacMillan Bloedel Limited: *See*—
Churchland, Mark T.; and Parker, David, 4,508,772, Cl. 428-106.000.

MacRae, Ralph A.: *See*—
Oehlke, Donald N.; MacRae, Ralph A.; Crammond, James; and Rattmann, Hans R., 4,508,477, Cl. 411-174.000.

MacWilliams, David; and Rigbey, Leonard J., to International Business Machines Corporation. Gravity feed chute. 4,508,204, Cl. 193-40.000.

Madarame, Michimasa; and Ueda, Kaichi, to Diesel Kiki Co., Ltd. Overheat detecting device of an air conditioning system for automotive vehicles. 4,507,935, Cl. 62-227.000.

Maeda, Kazuo, to Kabushiki Kaisha Kito. Electric hoist. 4,508,318, Cl. 254-350.000.

Magnavox Government and Industrial Electronics Company: *See*—
Kiess, Ronald J.; and Nichols, Gary R., 4,508,092, Cl. 123-617.000.

Maier, William. Easy access pulley box. 4,508,371, Cl. 285-121.000.

Maillet, Marc: *See*—
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Maio, Patrick S.: *See*—
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Makino, Kenzi: *See*—
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Makino, Naonori: *See*—
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,508,805, Cl. 430-72.000.

Malaney, Frank E., to Chicopee. Microfine fiber laminate. 4,508,113, Cl. 128-132.00D.

Malaviya, Shashi D.: *See*—
Goth, George R.; and Malaviya, Shashi D., 4,508,579, Cl. 148-175.000.

Malcolm, David H., to Titan Tool Inc. Current limited electrostatic spray gun system with positive feedback controlled constant voltage output. 4,508,276, Cl. 239-691.000.

Malecki, Edmund E.: *See*—
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Malinowski, Richard F., to General Electric Company. Sealed beam lamp unit and method for an improved sealed exhaust hole. 4,509,107, Cl. 362-267.000.

Malone, Thomas J., to Nutri-Developers, Inc. Apparatus for preparing feed grain. 4,508,029, Cl. 99-516.000.

Malten, Albrecht: *See*—
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Maltsev, Jury S.; Shevchenko, Viktor D.; and Chernin, Mikhail M. Squaring device with cooling means. 4,509,134, Cl. 364-813.000.

Mamantov, Gleb, to University of Tennessee Research Corporation. Sodium-tetravalent sulfur molten chloroaluminate cell. 4,508,795, Cl. 429-103.000.

Manabe, Seiichi: *See*—
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Manatt, Scott A., to Garrett Corporation, The. Air oxygen and nitrogen concentration device. 4,508,548, Cl. 55-158.000.

Manin, Michel, to Compagnie Generale de Geophysique. Method and device for initiating an underwater implosive seismic source. 4,508,191, Cl. 181-107.000.

Manne, Stanley: *See*—
Sak, Dennis A.; Mestetsky, Thomas; and Manne, Stanley, 4,509,196, Cl. 383-5.000.

Manowitz, Milton: *See*—
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Mansfield, Peter: *See*—
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Mansour, James D.; and Schulte, Thomas, to Becton Dickinson and Company. Detection of white cell associated bacteria with a fluorescent dye. 4,508,821, Cl. 435-34.000.

Manton, John C.; Okin, Kenneth; and Zacconi, Anthony N., to Digital Equipment Corporation. Two-port memory controller. 4,509,115, Cl. 364-200.000.

Manville Service Corporation: *See*—
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Peters, Walter B., 4,508,855, Cl. 523-153.000.

Maraschin, Norma J.: *See*—
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Marathon Oil Company: *See*—
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Marchetti, Renato; and Penco, Eugenio, to Selenia Industrie Elettroniche Associate S.p.A. Longitudinal-discharge-pulse laser with preionization obtained by corona effect. 4,509,176, Cl. 372-86.000.

Marcinkowsky, Arthur E.: *See*—
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Marcus, Holger: *See*—
Scholdstrom, Ragnar; Marcus, Holger; and Nordstrom, Lennart, 4,508,448, Cl. 356-5.000.

Mariani, Luigi; and Tarzia, Giorgio, to Gruppo Lepetit S.p.A. 1,7-Dihydro-pyrrolo[3,4-e][1,4]diazepin-2(3H)-one derivatives a process for preparing them and their use as anticonvulsant and anti-anxiety agents. 4,508,730, Cl. 514-218.000.

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Seely, James R., 4,507,887, Cl. 40-606.000.

Marsh, Barry J., to GKN Technology Limited. Composite leaf springs. 4,508,325, Cl. 267-47.000.

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Djordjevic, Borislav B.; and Traugott, Stephen C., 4,507,969, Cl. 73-644.000.

Martin & Pagenstecher GmbH: *See*—
Bauer, Gerhard; Hees, Eckart; and Beckers, Karl-Dieter, 4,508,241, Cl. 222-600.000.

Martin, Robert E.: *See*—
Gilbert, Wilbur E.; Martin, Robert E.; and Belonger, Donald P., 4,508,387, Cl. 297-429.000.

Martinec, Eugene F., to Health-Mor, Inc. Power nozzle sudser for canister type vacuum cleaner. 4,507,819, Cl. 15-321.000.

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Schonberger, Norbert; Schinzel, Erich; Martini, Thomas; and Rosch, Gunter, 4,508,900, Cl. 546-99.000.

Marui, Kuniyoshi: *See*—
Sekigawa, Tatsuaki; Gotoh, Akio; Tsutsumi, Syuitsu; Marui, Kuniyoshi; and Honda, Naoto, 4,509,201, Cl. 455-73.000.

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Tarui, Yuichi; and Obayashi, Toshio, 4,508,589, Cl. 156-584.000.

Maruska, H. Paul: *See*—
Moustakas, Theodore D.; and Maruska, H. Paul, 4,508,609, Cl. 204-192.00S.

Marvin Glass & Associates: *See*—
Klimpert, Randall J.; and Meyer, Burton C., 4,508,521, Cl. 446-486.000.
Kulesza, Ralph J., 4,508,517, Cl. 446-464.000.
Meyer, Steven M.; Kuna, Wayne A.; Morrison, Robert S.; Morrison, Howard J.; Ditton, Richard A.; and Ditton, Elaine A., 4,508,353, Cl. 273-313.000.

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Klenk, Emil; and Heina, Karl-Fritz, 4,508,214, Cl. 198-833.000.

Maschinenfabrik Alfred Schmermund GmbH & Co.: *See*—
Oberdorf, Manfred, 4,508,207, Cl. 198-478.000.

Maschinenfabrik HILMA GmbH: *See*—
Ersoy, Metin, 4,508,327, Cl. 269-23.000.

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Masovich, Felix Z.: *See*—
Spektor, Jury N.; Gaponov, Valery M.; and Masovich, Felix Z., 4,508,391, Cl. 299-43.000.

Massachusetts Institute of Technology: *See*—
Henshaw, Philip D., 4,508,431, Cl. 350-354.000.

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Sawyer, Carleton E.; and Masterman, Hugh C., 4,508,989, Cl. 310-184.000.

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Masuda, Yoshimichi: *See*—
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, 4,508,680, Cl. 419-5.000.

Mathieu, Jean-Paul, to ICG Gasbec Inc. Apparatus for testing flow meters. 4,507,952, Cl. 73-3.000.

Matier, William L.; Erhardt, Paul W.; and Patil, Ghanshyam, to American Hospital Supply Corporation. Esters of 3-(3-substituted-amino-2-hydroxypropoxy)-4-substituted-1,2,5-thiadiazole derivatives. 4,508,725, Cl. 514-362.000.

Matlock, Mark G.: *See*—
Hergenrother, William L.; Matlock, Mark G.; and Ambrose, Richard J., 4,508,874, Cl. 525-285.000.

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Yasuhara, Yutaka; Nishino, Masaki; and Matsuhisa, Seikichi, 4,508,918, Cl. 560-241.000.

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Kumata, Masao; and Matsuoka, Noriaki, 4,508,793, Cl. 429-26.000.

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Hasegawa, Shumpei; and Yamato, Akihiro, 4,508,083, Cl. 123-491.000.
Minakuchi, Hiroshi, 4,509,182, Cl. 377-116.000.
Ohara, Shunji; Yoshida, Tomio; Satoh, Isao; and Koishi, Kenji, 4,509,156, Cl. 369-54.000.
Takeda, Takeshi; Machida, Yasuhiko; Kudoh, Yasuo; and Ikegaya, Kazutoshi, 4,508,632, Cl. 252-70.000.
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Yoshimura, Hirofumi; and Ikeda, Nobuo, 4,508,946, Cl. 219-10.55F.

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Matsushita, Hidetoshi, 4,509,026, Cl. 335-85.000.
Omura, Koichi; and Yuasa, Hiroyoshi, 4,509,186, Cl. 381-43.000.

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Takamatsu, Toshiaki; Funada, Fumiaki; Yasuda, Shuhei; and Matsuura, Masataka, 4,509,099, Cl. 361-413.000.

Matsuzaki, Minoru; Hachimoto, Akihiko; Inoue, Takashi; Shirai, Hitoshi; Watanabe, Akira; and Tofukuji, Ikuo, to Olympus Optical Co., Ltd. Lens barrel. 4,508,443, Cl. 354-402.000.

Matzner, Bruce; Horn, Victor M.; Curulla, Michael V.; and Price, John F., to General Electric Company. Nuclear fuel assembly spacer. 4,508,679, Cl. 376-438.000.

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Muller, Michael; Mautner, Dietmar; and Motoren Turbinen-Union Munchen GmbH, 4,508,955, Cl. 219-146.210.

Maxwell, Gary A., to Eschem Inc. Paper product and glue therefor. 4,508,773, Cl. 428-198.000.

May, Joseph N.; and Wing, Joseph M., to Xerox Corporation. Multimode document handling apparatus and reproducing apparatus containing same. 4,508,444, Cl. 355-3.00R.

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Mayfield, John M., Jr.; and Haselswerdt, Vernon, to Microphor, Inc. Temperature controlled valve mechanism and method. 4,508,132, Cl. 137-62.000.

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Mashimo, Tohru; and Satoh, Osamu, 4,508,035, Cl. 102-313.000.
Oda, Tatsuro; Tanaka, Hideki; Yoshioka, Sadashichi; and Yokooku, Katsuhiko, 4,508,076, Cl. 123-339.000.
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Baldwin, Graham J.; and McCann, Michael O., 4,509,096, Cl. 361-386.000.

McCarthy, Alfred F., to Aavid Engineering, Inc. Heat sinks for integrated circuit modules. 4,508,163, Cl. 165-80.00B.

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Girsch, B. J. Maria; Girsch, Charles W.; and McCarthy, Thomas C., 4,508,512, Cl. 434-259.000.

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Casciotti, Albert; McCleerey, Earl W.; and Cosmos, Pete, 4,508,401, Cl. 339-14.00R.

McClure, David K., to Marathon Manufacturing Company. Spring clip for tilter worm shaft. 4,507,831, Cl. 24-590.000.

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McDavid, James M., to Texas Instruments Incorporated. Metallization process for integrated circuits. 4,507,853, Cl. 29-591.000.

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McGuire, Michael E.: *See*—
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McLaughlin, John R.; and Hertzenberg, Elliot P., to PQ Corporation. Treating beer to prevent chill haze and metal contamination. 4,508,742, Cl. 426-330.400.

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Keir, Grant G. H.; Peebles, John A.; McNab, Jonas K.; and Campbell, Ian N., 4,508,260, Cl. 232-43.100.

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McSweeney, Daniel R., to General Foods Corporation. Tabletted beverage composition containing dipeptide sweetener and process therefore. 4,508,740, Cl. 426-250.000.

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Adair, Paul C., 4,508,807, Cl. 430-138.000.

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Myers, George H., 4,508,121, Cl. 128-639.000.

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Amato, Joseph S.; Weinstock, Leonard M.; and Karady, Sandor, 4,508,921, Cl. 562-443.000.
Foor, Forrest; and Roberts, Gary P., 4,508,826, Cl. 435-235.000.

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Meurer, Wolfgang, to Jagenberg AG. Device for monitoring a cylinder-piston assembly. 4,507,994, Cl. 83-58.000.
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Meyer, Burton C.: *See*—
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Olsen, Ronald H., 4,508,823, Cl. 435-172.300.
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Micropore International Limited: *See*—
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Herman, Timm R.; and Mikic, Frank, 4,508,005, Cl. 81-177.00G.
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Kim, Chong Y.; Farver, Terry F.; and Brewer, Jack W., 4,508,825, Cl. 435-201.000.
Millard, Ralph A. Cable driven jack. 4,508,316, Cl. 254-4.00R.
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Elepano, Normita P.; Schnur, William H.; and Jorgensen, Jens L., 4,508,634, Cl. 252-163.000.
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Mizuno, Shigeru; Suzuki, Masahiko; Mizuno, Haruki; and Katsu, Masutaro, 4,508,567, Cl. 75-231.000.

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Takao, Mitsunori; and Mizuno, Toshiaki, 4,508,075, Cl. 123-339.000.

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Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,509,064, Cl. 346-207.000.

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Bergstrom, John R., 4,508,593, Cl. 162-29.000.

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Cormier, William E., Jr.; Pasquale, Gary M.; and Stover, William A., 4,508,840, Cl. 502-70.000.
Davis, Aaron J., 4,509,150, Cl. 367-76.000.
Haag, Werner O.; Olson, David H.; and Rodewald, Paul G., 4,508,836, Cl. 502-53.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,508,615, Cl. 208-89.000.
Ruehle, William H., 4,509,149, Cl. 367-27.000.
Yan, Tsoung Y., 4,508,614, Cl. 208-78.000.

Mocella, Michael T.: *See*—
Taylor, Paul D.; and Mocella, Michael T., 4,508,923, Cl. 568-311.000.

Mochel, Margaret E.; and Humphreys, Colin J., to University Patents, Inc. Electron beam cutting. 4,508,952, Cl. 219-121.0EH.

Mochida, Haruo, to Nissan Motor Company, Limited. Locking device of an automotive door. 4,508,379, Cl. 292-336.300.

Mode, Paul, to Nycoil Corporation. Releasable coupling device. 4,508,369, Cl. 285-39.000.

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Pedersen, Svend P.; Molbaek, Jens J.; and Hansen, Allan H., 4,508,262, Cl. 236-42.000.
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Moler Products Limited: *See*—
Elliott, Alwyn, 4,508,667, Cl. 264-13.000.

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Ivary, David J.; and Kirby, Raymond L., Jr., 4,508,252, Cl. 226-44.000.

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Mondel, Karl: *See*—
Seifert, Helmut; and Mondel, Karl, 4,508,286, Cl. 242-107.000.

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Money, Michael F. Foldable pen. 4,508,464, Cl. 401-6.000.

Monne, Maxime, to INTERCONTROLE Societe Anonyme. Mobile positioning body introduction device. 4,508,063, Cl. 122-504.000.

Monsanto Company: *See*—
Carter, Don E.; and Yuen, Henry K., 4,508,101, Cl. 126-436.000.
Dufour, Daniel L.; and Jones, William J., 4,508,870, Cl. 525-64.000.
Mottus, Edward H., 4,508,866, Cl. 524-401.000.
Sikorski, James A.; and Hoobler, Mary A., 4,508,663, Cl. 260-968.000.

Montabert, Roger, to Etablissements Montabert. Fluid-control system for a hydraulic percussion instrument. 4,508,017, Cl. 92-85.00B.

Montalto, Antonelli. Method of manufacturing clothing. 4,507,805, Cl. 2-243.00B.

Montgomery, Dean P., to Phillips Petroleum Company. Detection of catalyst by-passing in fixed bed naphtha reformer. 4,508,617, Cl. 208-134.000.

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Montheard, Jean-Pierre: *See*—
Camps, Marcel; Douillard, Alain; Dubois, Jean-Claude; Gazard, Maryse; Montheard, Jean-Pierre; Pascal, Thierry; and Seytre, Gerard, 4,508,639, Cl. 252-500.000.

Moore, John W.; and Thomas, William M., to Stewart Systems, Inc. Conveyor and sorting switch. 4,508,206, Cl. 198-365.000.

Moore, Victor S.: *See*—
Leininger, Joel C.; Moore, Victor S.; and Stahl, William L., Jr., 4,509,114, Cl. 364-200.000.

Morales, Liborio D. Foldable, self-supporting, adjustable book holder. 4,508,307, Cl. 248-460.000.

Moreuil, Rene , to Arconthorn Limited. Drug for stimulating hepatic cell homeostasis and for restoring the functional capacity of the hepatocytes. 4,508,733, Cl. 514-578.000.

Mori, Masao: *See*—
Inoue, Akira; Takase, Shinji; Sekido, Yasuo; Mori, Masao; and Kubo, Tatsuki, 4,508,849, Cl. 502-263.000.

Mori, Toshiro: *See*—
Hirose, Etsuro; Takahashi, Kimio; Mori, Toshiro; and Kaito, Haruyuki, 4,507,942, Cl. 68-20.000.

Morimoto, Tsuyoshi, to Totoku Co., Ltd. Latticed tubular fence and method of making same. 4,508,321, Cl. 256-65.000.

Morimoto, Yoshinobu: *See*—
Komurasaki, Satoshi; Ueda, Atsushi; Morimoto, Yoshinobu; and Kadota, Youichi, 4,508,079, Cl. 123-425.000.

Morimoto, Yoshiro; and Kishi, Norimasa, to Nissan Motor Company, Limited. Apparatus for controlling a direct drive clutch for a vehicle automatic transmission. 4,507,985, Cl. 74-866.000.

Morimoto, Yoshiro: *See*—
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,509,124, Cl. 364-424.100.

Morinaga, Kaoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Disc player apparatus with an improved disc clamper. 4,509,157, Cl. 369-75.200.

Morino, Toshiharu: *See*—
Tamura, Yoshio; Ito, Takaaki; and Morino, Toshiharu, 4,508,664, Cl. 261-44.00C.

Morishita, Akira: *See*—
Tanaka, Toshinori; and Morishita, Akira, 4,507,978, Cl. 74-7.00E.

Morita, Saichiro, to Yokogawa Hokushin Electric Corporation. Pressure gauge. 4,507,972, Cl. 73-708.000.

Morita, Shuji: *See*—
Kusui, Akio; Morita, Shuji; Kudoh, Toshio; Tanaka, Yasuo; and Itoh, Hirotaka, 4,508,414, Cl. 339-143.00R.

Morita, Teturo: *See*—
Koyama, Takahiro; Matsumura, Haruo; and Morita, Teturo, 4,508,893, Cl. 536-85.000.

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Kanda, Masahiro; Hatakeyama, Tetsuya; and Morito, Yusuke, 4,508,640, Cl. 252-503.000.

Moriuchi, Fumio: *See*—
Oseto, Osamu; and Moriuchi, Fumio, 4,508,806, Cl. 430-109.000.

Morris, Jeffrey R.: *See*—
Kaniuk, John A.; Meinking, William E.; and Morris, Jeffrey R., 4,508,835, Cl. 501-94.000.

Morrison, Elbert F., to Burlington Industries, Inc. Vacuum spinning. 4,507,913, Cl. 57-328.000.

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Meyer, Steven M.; Kuna, Wayne A.; Morrison, Robert S.; Morrison, Howard J.; Ditton, Richard A.; and Ditton, Elaine A., 4,508,353, Cl. 273-313.000.

Morrison, Robert S.: *See*—
Meyer, Steven M.; Kuna, Wayne A.; Morrison, Robert S.; Morrison, Howard J.; Ditton, Richard A.; and Ditton, Elaine A., 4,508,353, Cl. 273-313.000.

Mortenson, John A.: *See*—
Gumaer, Robert A.; and Mortenson, John A., 4,509,119, Cl. 364-200.000.

Moseley, Patrick T.; and Bridger, Nevill J., to United Kingdom Atomic Energy Authority. Lead acid electric storage cell and a positive electrode therefor. 4,507,855, Cl. 29-623.100.

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Mosley, Joseph M.: *See*—
Dorler, Jack A.; Mosley, Joseph M.; and Weitzel, Stephen D., 4,508,981, Cl. 307-542.000.

Mosley, William H., Jr.: *See*—
Andren, Carl F.; Mosley, William H., Jr.; and Sanders, David E., 4,509,017, Cl. 329-105.000.

Moss, Gerald, to Exxon Research & Engineering Co. Converting a fuel to combustible gas. 4,508,544, Cl. 48-197.00R.

Mossaides, Paula X., to Tektronix, Inc. Method and apparatus for displaying images. 4,509,043, Cl. 340-721.000.

Mostek Corporation: *See*—
Ackmann, Paul W.; and Bryant, Frank R., 4,508,815, Cl. 430-314.000.

Motegi, Masahiko: *See*—
Miura, Yasuki; Motegi, Masahiko; and Okabe, Kazuo, 4,508,782, Cl. 428-409.000.

Motoren Turbinen-Union Munchen GmbH: *See*—
Muller, Michael; Mautner, Dietmar; and Motoren Turbinen-Union Munchen GmbH, 4,508,955, Cl. 219-146.210.

Motorola, Inc.: *See*—
Ackerman, Charles B., 4,508,970, Cl. 250-577.000.
Allgood, Robert N.; Peterson, Joe W.; and Whatley, Roger A., 4,508,983, Cl. 307-577.000.
Gardiner, George K.; and Norris, Dean E., 4,509,054, Cl. 343-709.000.
Parker, Norman W., 4,509,135, Cl. 364-826.000.

Mottus, Edward H., to Monsanto Company. Polymeric antitumor agent. 4,508,866, Cl. 524-401.000.

Mouftah, Hussein T., to Queen's University at Kingston. Microprocessor based digital to digital converting dataset. 4,509,164, Cl. 370-29.000.

Mouilhayrat, Guy G.; Duchon, Paul A. J.; Guilbert, Jean M. A. M.; and Rolfo, Andre A., to Centre National d'Etudes Spatiales. Satellite on an equatorial orbit with improved solar means. 4,508,297, Cl. 244-173.000.

Moustakas, Theodore D.; and Maruska, H. Paul, to Exxon Research & Engineering Co. Method for sputtering a PIN microcrystalline/amorphous silicon semiconductor device with the P and N-layers sputtered from boron and phosphorous heavily doped targets. 4,508,609, Cl. 204-192.00S.

Moutonnier, Claude: *See*—
Berger, Christian; Farge, Daniel; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,508,717, Cl. 514-203.000.

Mower, Michael L.: *See*—
Packard, Gary R.; and Mower, Michael L., 4,508,203, Cl. 192-84.00C.

MTS Systems Corporation: *See*—
Meyer, Richard A.; and Meline, Harry R., 4,507,871, Cl. 33-148.00D.

Mudde, John P., to CPC International Inc. Hot-water dispersible corn starch having high paste viscosity. 4,508,576, Cl. 106-213.000.

Mueller, Josef; Wiersdorff, Walter-Wielant; Kirschenlohr, Werner; and Schwantje, Gerd, to BASF Aktiengesellschaft. Preparation of o-acylphenols and p-acylphenols. 4,508,924, Cl. 568-322.000.

Muesch, Herbert: *See*—
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,508,716, Cl. 514-220.000.

Muhle, Mike E.; Stolz, Richard J.; and Wright, Cecil W., to Exxon Research & Engineering Co. Finishing of rotational molding grade resin. 4,508,859, Cl. 523-346.000.

Mulders, Gerardus L. M.; and Hermans, Jacobus G. J. M., to Bitumarin B.V. Method and machine for the layered placing of core material and of the adjacent transitional material for dams. 4,508,471, Cl. 405-109.000.

Muller, Erwin, to Siemens Aktiengesellschaft. Electromagnetic relay. 4,509,028, Cl. 335-202.000.

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Mummery, Robert J.: *See*—
Mlinaric, Jerry; Leary, William; and Mummery, Robert J., 4,508,485, Cl. 414-458.000.

Muncaster, John W.; Roberts, Michael G.; Rowlett, R. David; Hoitink, Todd B.; Uffner, William E.; and White, Robert N., to Owens-Corning Fiberglas Corporation. Road repair material of knitted unidirectional glass roving mat coated with elastomeric modified asphalt. 4,508,770, Cl. 428-63.000.

Mund, Konrad: *See*—
Freller, Helmut; Horauf, Friedrich; Lorenz, Hans-Peter; and Mund, Konrad, 4,508,430, Cl. 350-351.000.
Freller, Helmut; and Mund, Konrad, 4,508,432, Cl. 350-357.000.

Murakami, Kakuji: *See*—
Fujii, Tadashi; Yamaguchi, Tomoyuki; Murakami, Kakuji; Kawakami, Tomiko; and Uenozono, Hiroko, 4,508,570, Cl. 106-20.000.

Murakami, Tsudoi; Nasu, Shoji; Tatsumi, Kazuaki; and Nagahama, Yasuhide, to Kabushiki Kaisha Kobe Seiko Sho. Method of multilayer welding. 4,508,953, Cl. 219-125.100.

Murase, Satoru: *See*—
Wada, Hitoshi; Tachikawa, Kyoji; Yamada, Yutaka; and Murase, Satoru, 4,508,578, Cl. 148-11.50F.

Murasugi, Takashi: *See*—
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,509,124, Cl. 364-424.100.

Murata Kikai Kabushiki Kaisha: *See*—
Noguchi, Kazuyoshi, 4,507,912, Cl. 57-22.000.

Murata Manufacturing Co., Ltd.: *See*—
Senda, Atsuo; Kasanami, Tohru; and Nakagawa, Takuji, 4,508,756, Cl. 427-81.000.

Murphy, Kenneth E.: *See*—
Wiegardt, Gordon K.; Hanks, Thomas W.; and Murphy, Kenneth E., 4,508,176, Cl. 172-7.000.

Murphy, William A.: *See*—
Coy, David H.; and Murphy, William A., 4,508,711, Cl. 514-11.000.

Murray, James A.: *See*—
Handy, Richard L.; and Murray, James A., 4,508,472, Cl. 405-229.000.

Mustee, Robert J., to E. L. Mustee & Sons, Inc. Laundry tub mounting apparatus. 4,508,304, Cl. 248-311.200.

Mut, Alan D.; and Deans, Harry A., to Exxon Production Research Co. Method for determining connate water saturation and salinity in reservoirs. 4,508,169, Cl. 166-250.000.

Myers, George H., to Medsys, Inc. Apparatus for measurement of corneal thickness. 4,508,121, Cl. 128-639.000.

Mynderse, Jon S.; and O'Connor, Sean C., to Eli Lilly and Company. Quiuolizine and indolizine enzyme inhibitors. 4,508,901, Cl. 546-112.000.

N. Schlumberger and Cie: *See*—
Herubel, Jean-Frederic, 4,507,822, Cl. 17-23.000.

Nabisco Brands, Inc.: *See*—
Stroz, John J.; and Mackay, Donald A. M., 4,508,713, Cl. 514-60.000.

Nadler, Morton. Process and device for the binarization of a pattern. 4,509,195, Cl. 382-51.000.

Nagae, Yoshiharu; Isogai, Masato; Kawakami, Hideaki; and Nakano, Fumio, to Hitachi, Ltd. Method for driving liquid crystal element employing ferroelectric liquid crystal. 4,508,429, Cl. 350-350.00S.

Nagahama, Yasuhide: *See*—
Murakami, Tsudoi; Nasu, Shoji; Tatsumi, Kazuaki; and Nagahama, Yasuhide, 4,508,953, Cl. 219-125.100.

Nagai, Kineshiro; and Nagai, Kinuko. Method of treating inflammatory diseases. 4,508,728, Cl. 514-400.000.

Nagai, Kinuko: *See*—
Nagai, Kineshiro; and Nagai, Kinuko, 4,508,728, Cl. 514-400.000.

Nagaishi, Hatsuo: *See*—
Okamura, Kenji; Nagaishi, Hatsuo; Kitahara, Tsuyoshi; Sone, Kohki; and Nakamura, Koyo, 4,507,986, Cl. 74-866.000.

Nagase, Toshio: *See*—
Joh, Yasushi; Kaneko, Noriaki; and Nagase, Toshio, 4,508,535, Cl. 604-282.000.

Nagata, Koichi, to Kyoto Ceramic Co., Ltd. Ceramic body for chromatography and process for preparation thereof. 4,508,624, Cl. 210-658.000.

Nagata, Wataru; Nishitani, Yasuhiro; and Sato, Hisao, to Shionogi & Co., Ltd. Synthesis of hydroxyethyltetrazolethiol and etherified intermediates therefor. 4,508,909, Cl. 548-251.000.

Nagatomi, Akihiko, to DX Antenna Company, Limited. Satellite broadcast signal receiving system. 4,509,198, Cl. 455-4.000.

Najima, Tetsuo; Tetsuta, Setsuya; Sawata, Yukitaka; and Yamagishi, Masahiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of and apparatus for feeding and discharging air for pneumatic jigs. 4,508,620, Cl. 209-500.000.

Nakabayashi, Hirohiko: *See*—
Miyake, Masayoshi; Ueoka, Isao; Kawaguchi, Munetaka; Nakabayashi, Hirohiko; and Yamamoto, Teruyuki, 4,508,779, Cl. 428-383.000.

Nakagawa, Takayuki, to Fujitsu Limited. Method for producing negative resist images. 4,508,813, Cl. 430-296.000.

Nakagawa, Takuji: *See*—
Senda, Atsuo; Kasanami, Tohru; and Nakagawa, Takuji, 4,508,756, Cl. 427-81.000.

Nakagawa, Yoshitaka: *See*—
Irie, Taisuke; Nakagawa, Yoshitaka; Tatano, Masayoshi; Watanabe, Koichi; and Watanabe, Eiji, 4,508,600, Cl. 204-27.000.

Nakai, Masayuki, to Idemitsu Kosan Company Limited. Process for improving low quality coal. 4,508,539, Cl. 44-10.00D.

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Nakamura, Koyo: *See*—
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Nakamura, Taku: *See*—
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Nakamura, Toshiaki: *See*—
Kusakawa, Yukio; Nakamura, Toshiaki; Ina, Yoshifumi; and Inbe, Takashi, 4,508,492, Cl. 417-366.000.

Nakano, Fumio: *See*—
Nagae, Yoshiharu; Isogai, Masato; Kawakami, Hideaki; and Nakano, Fumio, 4,508,429, Cl. 350-350.00S.

Nakano, Kenichi: *See*—
McIver, George W.; Nakano, Kenichi; and Berenz, John J., 4,507,845, Cl. 29-571.000.

Nakano, Kenji, to Sony Corporation. Head tracking control for video tape recorder. 4,509,083, Cl. 360-77.000.

Nakaoki, Tokuzo: *See*—
Sakata, Hideo; and Nakaoki, Tokuzo, 4,507,895, Cl. 51-98.00R.

Nakashima, Hisao: *See*—
Umeda, Jun-ichi; Nakashima, Hisao; Kajimura, Takashi; and Kuroda, Takao, 4,509,173, Cl. 372-50.000.

Nakato, Hakaru; Sakuraya, Toshikazu; Habu, Yasuhiro; Emi, Toshihiko; Kodama, Masanori; Koshikawa, Takao; Yoshida, Yoshimitsu; and Shimokawa, Fumitaka, to Kawasaki Steel Corporation; and Sakai Chemical Industry Co., Ltd. Mold additives for use in continuous casting. 4,508,571, Cl. 106-38.280.

Nakayama, Kengo: *See*—
Yashima, Michio; Komatsu, Akihiro; Takanashi, Masami; Hirose, Masashi; and Nakayama, Kengo, 4,508,944, Cl. 200-61.850.

Nakayama, Koji; Yoshida, Ryo; and Matsumoto, Hiroshi, to Sumitomo Chemical Company, Limited. Benzylsulfinyl pyridine-N-oxides and their herbicidal method of use. 4,508,562, Cl. 71-94.000.

Nakazumi, Tadataka: *See*—
Takeuchi, Nobuo; Kaneko, Tadashi; Nakazumi, Tadataka; and Yokooku, Katsuhiko, 4,508,078, Cl. 123-399.000.

Nalco Chemical Company: *See*—
Jansma, Roger H.; and Sandberg, Karen R., 4,508,594, Cl. 162-135.000.

Nankervis, Robert L. Adjustable press jig for front wheel strut assembly. 4,507,835, Cl. 29-251.000.

Nasu, Shoji: *See*—
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National Aerospace Laboratory of Science and Technology Agency: *See*—
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, 4,508,680, Cl. 419-5.000.

National Distillers and Chemical Corporation: *See*—
van Dijk, Jacob; Renken, Johannes W.; Dekker, Jan G.; and Helmond, Johannes, 4,508,652, Cl. 260-407.000.

National Research Development Corporation: *See*—
Berry, Paul S.; Kettlewell, Peter J.; and Turner, Michael J. B., 4,508,062, Cl. 119-82.000.
Weight, John P., 4,509,153, Cl. 367-140.000.

National Research Institute: *See*—
Wada, Hitoshi; Tachikawa, Kyoji; Yamada, Yutaka; and Murase, Satoru, 4,508,578, Cl. 148-11.50F.

National Semiconductor Corporation: *See*—
Wile, Donald T., 4,509,204, Cl. 455-169.000.

Natsume, Toshio: *See*—
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,508,682, Cl. 420-590.000.

Naul, George M.: *See—*
Stahl, Steven B.; Bakhshi, Shiv K.; and Naul, George M., 4,508,673, Cl. 264-120.000.
Nave, Rafi: *See—*
Palmer, John; Ravenel, Bruce; and Nave, Rafi, 4,509,144, Cl. 364-900.000.
Naya, Masaru; and Ikeda, Tsuneichi, to Tokyo Shibaura Denki Kabushiki Kaisha; and Kanazawa Industries. Extract generating device. 4,508,023, Cl. 99-279.000.
NCR Canada Ltd-NCR Canada LTEE: *See—*
Therrien, Roger H., 4,509,077, Cl. 358-139.000.
NCR Corporation: *See—*
Keir, Grant G. H.; Peebles, John A.; McNab, Jonas K.; and Campbell, Ian N., 4,508,260, Cl. 232-43.100.
Sullivan, Paul A., 4,507,847, Cl. 29-576.00B.
NECCHI Societa per Azioni: *See—*
Bianchi, Nereo, 4,508,042, Cl. 112-226.000.
Needleman, Philip, to Washington University. Atrial peptide. 4,508,712, Cl. 514-11.000.
Neese, Wayne E.: *See—*
Stepan, William E.; Neese, Wayne E.; Belanger, Thomas D., Jr.; and Janninck, Robert F., 4,508,398, Cl. 339-17.0LM.
Nelson, David E.: *See—*
Hollinger, David P.; Nelson, David E.; and Hannon, Robert J., 4,509,170, Cl. 370-85.000.
Nelson, Paul A.: *See—*
Knoedler, Reinhard; Nelson, Paul A.; Shimotake, Hiroshi; and Battles, James E., 4,508,797, Cl. 429-184.000.
Nemes, Jozsef: *See—*
Fogassy, Elemer; Toke, Laszlo ; Faigl, Ferenc; Soos, Rudolf; Bozzay, Jozsef; Kolta, Rezso; Nemes, Jozsef; and Bencsik, Peter, 4,508,919, Cl. 562-401.000.
Nemoto, Tadashi; Fukumoto, Ryoichi; Kawamura, Hiroaki; Kondo, Yoshikazu; and Inui, Tsuneo, to Toyo Kohan Co., Ltd. Process for producing a thin tin and zinc plated steel sheet. 4,508,601, Cl. 204-38.500.
New Cosmos Electric Col, Ltd.: *See—*
Sakai, Sai, 4,509,034, Cl. 338-34.000.
Newell Companies, Inc.: *See—*
Kornely, Edward B.; and Paul, Gerald T., 4,508,768, Cl. 428-35.000.
Newell, Richard G.; and Wolf, Stephen F., to Minnesota Mining and Manufacturing Company. Curable substituted urethane acrylates. 4,508,916, Cl. 556-420.000.
Newsome, Allen L., Jr.: *See—*
Wyatt, Philip W.; Newsome, Allen L., Jr.; Bloom, William G.; Siegel, Bernard; and Lubov, Michael, 4,508,123, Cl. 128-692.000.
Neyer, Norbert, to LGZ Landis & Gyr Zug AG. Method and an apparatus for correcting distortion of binary received signals. 4,509,180, Cl. 375-76.000.
Nichias Corporation: *See—*
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,508,777, Cl. 428-280.000.
Nichirin Chemical Industries Ltd.: *See—*
Koyama, Takahiro; Matsumura, Haruo; and Morita, Teturo, 4,508,893, Cl. 536-85.000.
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Kiess, Ronald J.; and Nichols, Gary R., 4,508,092, Cl. 123-617.000.
Nicholson, Timothy J. H.; Lee, Andrew L.; and Roberts, Clifford. Shelf support. 4,508,301, Cl. 248-250.000.
Nicola, Massimo: *See—*
Tricerri, Silvia Z.; Casagrande, Cesare; De Marchi, Franco; and Nicola, Massimo, 4,508,719, Cl. 514-236.000.
Nielsen Industries, Inc.: *See—*
Anderson, Bernard O., 4,508,059, Cl. 119-14.030.
Niggli, Guido: *See—*
Plaschka, Emil; Pauls, Mathias; and Niggli, Guido, 4,508,244, Cl. 222-153.000.
Nii, Katsutoshi: *See—*
Doi, Motomichi; Okano, Kinpei; Nii, Katsutoshi; and Yokota, Yoshiharu, 4,508,396, Cl. 384-463.000.
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, to National Aerospace Laboratory of Science and Technology Agency. Method of manufacturing a rocket combustion chamber. 4,508,680, Cl. 419-5.000.
Niitti, Timo U.; and Niskala, Alvar M., to Outokumpu Oy. Procedure for providing the vanes of the stator of a flotation machine with a cover and for fixing the cover. 4,508,619, Cl. 209-169.000.
Nijssen, Wilhelmus P. M.: *See—*
Gravesteijn, Dirk J.; Steenbergen, Christiaan; Van der Veen, Jan; and Nijssen, Wilhelmus P. M., 4,508,811, Cl. 430-270.000.
Nilsson, Karl E., to Bayern-Chemie Gesellschaft fur flugchemische Antriebe mit beschrankter Haftung. Winding attachment for safety belts in vehicles. 4,508,287, Cl. 242-107.000.
Nilsson, Karl E., to Bayern-Chemie Gesellschaft fur flugchemische Antriebe mit beschrankter Haftung. Winding attachment for belts. 4,508,288, Cl. 242-107.000.
Nimry, Tayseer S.; and Fields, Ellis K., to Standard Oil Company (Indiana). Nonaromatic dianhydride and polyimides from tricyclo[4.2.1.$0^{2,5}$] nonane-3,4-dimethyl-3,4,7,8-tetracarboxylic acid dianhydride. 4,508,605, Cl. 204-158.00R.
Ninetronix, Inc.: *See—*
Drews, Robert C.; Meyer, Danny D.; Shalon, Tadmor; and Pasternak, Eliezer, 4,508,532, Cl. 604-22.000.
Nintendo Co., Ltd.: *See—*
Yokoi, Gunpei, 4,508,336, Cl. 273-1.00L.
Nippon Electric Co., Ltd.: *See—*
Hirano, Akira, 4,509,038, Cl. 340-347.0DD.
Ichihara, Masaki, 4,509,199, Cl. 455-7.000.
Tamura, Yoshiharu, 4,509,165, Cl. 370-38.000.
Togari, Hisashi, 4,508,979, Cl. 307-513.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Kenji, Yokoyama, 4,509,101, Cl. 361-79.000.
Oshima, Yutaka, 4,508,575, Cl. 106-148.000.
Suzuki, Hideo, 4,508,001, Cl. 84-1.010.
Nippon Mektron Ltd.: *See—*
Inaba, Masaichi, 4,508,942, Cl. 200-5.00A.
Nippon Oil Company, Limited: *See—*
Inoue, Akira; Takase, Shinji; Sekido, Yasuo; Mori, Masao; and Kubo, Tatsuki, 4,508,849, Cl. 502-263.000.
Nippon Paint Co., Ltd.: *See—*
Sakurai, Kiyomi; and Arimatsu, Seiji, 4,508,814, Cl. 430-303.000.
Nippon Seiki Kabushiki Kaisha: *See—*
Yachida, Yoichi, 4,509,044, Cl. 340-789.000.
Nippon Telegraph and Telephone Public Corp.: *See—*
Harada, Kazuhiro; Tsuchiya, Yuzoh; Sekiguchi, Nobuo; and Ishikawa, Toshio, 4,508,251, Cl. 226-25.000.
Nippon Zeon Co., Ltd.: *See—*
Joh, Yasushi; Kaneko, Noriaki; and Nagase, Toshio, 4,508,535, Cl. 604-282.000.
Nippondenso Co., Ltd.: *See—*
Kusakawa, Yukio; Nakamura, Toshiaki; Ina, Yoshifumi; and Inbe, Takashi, 4,508,492, Cl. 417-366.000.
Takao, Mitsunori; and Mizuno, Toshiaki, 4,508,075, Cl. 123-339.000.
Nishida, Haruki: *See—*
Sogo, Hiroyuki; Ohsawa, Zenichi; Umino, Isamu; and Nishida, Haruki, 4,509,208, Cl. 455-317.000.
Nishijima, Ryoji: *See—*
Matsuo, Yoshiho; Yoshino, Atsuhiko; and Nishijima, Ryoji, 4,508,878, Cl. 525-333.800.
Nishikawa, Kazunori: *See—*
Masuda, Isao; Nishikawa, Kazunori; Iwasaki, Yoshiki; and Komura, Makoto, 4,509,155, Cl. 369-48.000.
Nishikawa, Seiichi: *See—*
Num: zawa, Akio; Sakai, Ichio; Kumagai, Tadanobu; and Nishikawa, Seiichi, 4,508,522, Cl. 464-11.000.
Nishimoto, Kazuo: *See—*
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,508,777, Cl. 428-280.000.
Nishimura, Katsuji: *See—*
Horigome, Koichi; Okada, Seizo; Nishimura, Katsuji; and Yamamoto, Hachizou, 4,509,136, Cl. 364-900.000.
Nishino, Masaki: *See—*
Yasuhara, Yutaka; Nishino, Masaki; and Matsuhisa, Seikichi, 4,508,918, Cl. 560-241.000.
Nishio, Tadashi, to Olympus Optical Co., Ltd. Sheet feeder for copying machines. 4,508,332, Cl. 271-118.000.
Nishita, Kazuko D.: *See—*
Bean, Maura M.; Nishita, Kazuko D.; and Hoops, Elizabeth A., 4,508,736, Cl. 426-19.000.
Nishitani, Yasuhiro: *See—*
Nagata, Wataru; Nishitani, Yasuhiro; and Sato, Hisao, 4,508,909, Cl. 548-251.000.
Nishiwaki, Kenichiro; Sakai, Tomio; and Ohkubo, Takashi, to Denki Kagaku Kogyo Kabushiki Kaisha. Elastomer of acrylic ester type copolymer. 4,508,885, Cl. 526-318.000.
Nishiwaki, Yoshikazu, to Sumitomo Electric Industries, Ltd. Optical system. 4,508,420, Cl. 350-3.600.
Nishiyama, Taichiro; and Tsuji, Shinsaku, to Nissan Motor Company, Limited. Low vibration-level remote control gearshift linkage for manual transmission. 4,507,980, Cl. 74-473.00R.
Niskala, Alvar M.: *See—*
Niitti, Timo U.; and Niskala, Alvar M., 4,508,619, Cl. 209-169.000.
Nissan Chemical Industries Ltd.: *See—*
Sakata, Gozyo; Numata, Tatsuo; Makino, Kenzi; Kakuta, Takuya; Kusano, Kazuya; Ikai, Takasi; and Oguti, Tosihiko, 4,508,561, Cl. 71-94.000.
Nissan Chemical Industries Ltd: *See—*
Matsuo, Yoshiho; Yoshino, Atsuhiko; and Nishijima, Ryoji, 4,508,878, Cl. 525-333.800.
Nissan Maruzen Polyethylene Company: *See—*
Matsuo, Yoshiho; Yoshino, Atsuhiko; and Nishijima, Ryoji, 4,508,878, Cl. 525-333.800.
Nissan Motor Company, Limited: *See—*
Hiraiwa, Kazuyoshi; and Yamasaki, Saburou, 4,507,981, Cl. 74-477.000.
Mochida, Haruo, 4,508,379, Cl. 292-336.300.
Morimoto, Yoshiro; and Kishi, Norimasa, 4,507,985, Cl. 74-866.000.
Nishiyama, Taichiro; and Tsuji, Shinsaku, 4,507,980, Cl. 74-473.00R.
Okamura, Kenji; Nagaishi, Hatsuo; Kitahara, Tsuyoshi; Sone, Kohki; and Nakamura, Koyo, 4,507,986, Cl. 74-866.000.
Seko, Yasutoshi; Inoue, Masami; and Yanagishima, Takayuki, 4,509,040, Cl. 340-576.000.
Shimbara, Hiroyuki, 4,508,077, Cl. 123-357.000.
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,509,124, Cl. 364-424.100.
Tsumoto, Akio; and Kano, Hisae, 4,508,382, Cl. 296-213.000.

Nisshin Steel Company, Ltd.: *See*—
Irie, Taisuke; Nakagawa, Yoshitaka; Tatano, Masayoshi; Watanabe, Koichi; and Watanabe, Eiji, 4,508,600, Cl. 204-27.000.
Nitschko, Theodor: *See*—
Svoboda, Josef; Nitschko, Theodor; and Wittmann, Heinz, 4,508,361, Cl. 280-628.000.
Nitto Kohki Co., Ltd.: *See*—
Takeuchi, Hirosato; and Mikiya, Toshio, 4,508,104, Cl. 126-443.000.
Nixdorf Computer AG: *See*—
Simon, Joachim W., 4,509,166, Cl. 370-62.000.
NL Sperry-Sun, Inc.: *See*—
Russell, Anthony W.; and Russell, Michael K., 4,507,958, Cl. 73-151.000.
Noguchi, Hideo: *See*—
Minami, Kenji; Katagiri, Masaru; and Noguchi, Hideo, 4,509,067, Cl. 357-13.000.
Noguchi, Kazuyoshi, to Murata Kikai Kabushiki Kaisha. Pneumatic yarn splicing apparatus. 4,507,912, Cl. 57-22.000.
Noguchi, Tetsuo; and Kuwabara, Kanji, to Kabushiki Kaisha Okawara Seisakusho. Method of and system for incinerating sludge. 4,508,039, Cl. 110-258.000.
Nold, Peter: *See*—
Eschmann, Friedrich; Gelsdorf, Gunter; Nold, Peter; Staats, Gotthard; and Subat, Gerhard, 4,508,504, Cl. 432-217.000.
Nolden, Wilhelm, to Abex Corporation. Hydraulic axial piston machine. 4,508,011, Cl. 91-506.000.
Nomoto, Sadao; and Iida, Kazuyoshi, to Bridgestone Tire Company Limited. Method and apparatus for forming photographic record of sound field. 4,509,061, Cl. 346-107.00R.
Nordica S.p.A.: *See*—
Vaccari, Franco; and Balbinot, Renzo, 4,507,877, Cl. 36-2.600.
Nordstrom, Lennart: *See*—
Scholdstrom, Ragnar; Marcus, Holger; and Nordstrom, Lennart, 4,508,448, Cl. 356-5.000.
Noren, Gerry K.; Poklacki, Erwin S.; Hawker, Fred D.; and Sich, Janice M., to DeSoto, Inc. Preparation of isocyanate-terminated polyurethanes containing amino silanes. 4,508,889, Cl. 528-28.000.
Norlin Industries: *See*—
Hall, George R.; Hall, Robert J.; and Cookerly, Jack C., 4,508,002, Cl. 84-1.030.
Norota, Kazuhiko: *See*—
Ito, Toshimitsu; and Norota, Kazuhiko, 4,508,086, Cl. 123-492.000.
Norris, Dean E.: *See*—
Gardiner, George K.; and Norris, Dean E., 4,509,054, Cl. 343-709.000.
North American Decorative Products Inc.: *See*—
Ashton, Richard D. A., 4,508,230, Cl. 211-181.000.
North, Willard F.: *See*—
Beavers, John A.; and North, Willard F., 4,508,583, Cl. 156-94.000.
Northern Telecom Limited: *See*—
Reintjes, Anthony B.; Fleming, Robert J.; and Gumb, Bev W. T., 4,508,755, Cl. 427-58.000.
Nova Tran Corporation: *See*—
Olson, Roger; and Versic, Ronald J., 4,508,760, Cl. 427-213.340.
Nowakowski, Victor A.: *See*—
Hitt, Gerard J.; Nowakowski, Victor A.; and Warren, Walter R., 4,507,962, Cl. 73-384.000.
Numata, Tatsuo: *See*—
Sakata, Gozyo; Numata, Tatsuo; Makino, Kenzi; Kakuta, Takuya; Kusano, Kazuya; Ikai, Takasi; and Oguti, Tosihiko, 4,508,561, Cl. 71-94.000.
Numazawa, Akio; Sakai, Ichio; Kumagai, Tadanobu; and Nishikawa, Seiichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Double cardan universal joint. 4,508,522, Cl. 464-11.000.
Nutri-Developers, Inc.: *See*—
Malone, Thomas J., 4,508,029, Cl. 99-516.000.
Nycoil Corporation: *See*—
Mode, Paul, 4,508,369, Cl. 285-39.000.
O.K. Industries Inc.: *See*—
Weltman, David; and Tsipenyuk, Pyotr, 4,508,403, Cl. 339-28.000.
Oakland Corporation, The: *See*—
Wallace, Richard B., 4,508,759, Cl. 427-195.000.
Obayashi, Toshio: *See*—
Tarui, Yuichi; and Obayashi, Toshio, 4,508,589, Cl. 156-584.000.
Oberdorf, Manfred, to Maschinenfabrik Alfred Schmermund GmbH & Co. Cigarette handling apparatuses. 4,508,207, Cl. 198-478.000.
Oberschmid, Raimund; and Feigt, Ingmar, to Siemens Aktiengesellschaft. Recording and readout apparatus for X-rays. 4,508,966, Cl. 250-327.200.
O'Brien-Goins-Simpson & Associates: *See*—
Walker, Thad O.; Simpson, Jay P.; and Dearing, Harry L., 4,508,628, Cl. 252-8.50P.
Obrist, Albert; and Gadgill, Balkrishna B., to Sulzer Brothers Limited. Method of producing very pure magnesium oxide. 4,508,690, Cl. 423-173.000.
Occidental Chemical Corporation: *See*—
Chow, Richard H.; and Geering, Emil J., 4,508,661, Cl. 260-544.00D.
Chow, Richard H.; and Geering, Emil J., 4,508,857, Cl. 260-544.00D.
Ochiai, Takashi: *See*—
Yoneda, Naoto; Kato, Jyoji; Hayashi, Kimiaki; Ochiai, Takashi; and Kinashi, Keizo, 4,508,727, Cl. 514-398.000.
Ochiai, Takeji, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,508,636, Cl. 252-301.360.
Ochs, Joe A. Spinner type fishing lure. 4,507,892, Cl. 43-42.180.
Ochsner, Paul A.: *See*—
Crameri, Yvo; Ochsner, Paul A.; and Schudel, Peter, 4,508,925, Cl. 568-442.000.
O'Connor, Sean C.: *See*—
Mynderse, Jon S.; and O'Connor, Sean C., 4,508,901, Cl. 546-112.000.
Oda, Tatsuro; Tanaka, Hideki; Yoshioka, Sadashichi; and Yokooku, Katsuhiko, to Mazda Motor Corporation. Idling speeding control system for internal combustion engine. 4,508,076, Cl. 123-339.000.
Oehlke, Donald N.; MacRae, Ralph A.; Crammond, James; and Rattmann, Hans R., to Eaton Corporation. Fastening device. 4,508,477, Cl. 411-174.000.
Oftedahl, Glen F., to Pneumo Corporation. Multiple thermocouple connector panel. 4,508,416, Cl. 339-176.00M.
Ogasawara, Yoshinari, to CKD Corporation. Drain discharging apparatus. 4,508,143, Cl. 137-636.100.
Ogawa, Masahide: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,509,064, Cl. 346-207.000.
Ogawa, Masashi; Ishigaki, Kunio; Iwasaki, Nobuyuki; and Nakamura, Taku, to Fuji Photo Film Co., Ltd. Silver halide photographic sensitive materials. 4,508,818, Cl. 430-523.000.
Ogawa, Ryota, to Asahi Kogaku Kogyo Kabushiki Kaisha. Bright medium-range telephoto lens. 4,508,434, Cl. 350-454.000.
Ogi, Katsumi: *See*—
Kimura, Etsuji; Ogi, Katsumi; and Sato, Kazusuke, 4,508,322, Cl. 266-149.000.
Ogilvie, Kelvin K. Antiviral triazine compounds. 4,508,898, Cl. 544-211.000.
Oguti, Tosihiko: *See*—
Sakata, Gozyo; Numata, Tatsuo; Makino, Kenzi; Kakuta, Takuya; Kusano, Kazuya; Ikai, Takasi; and Oguti, Tosihiko, 4,508,561, Cl. 71-94.000.
Ohara, Shunji; Yoshida, Tomio; Satoh, Isao; and Koishi, Kenji, to Matsushita Electric Industrial Co., Ltd. Semiconductor laser driving system. 4,509,156, Cl. 369-54.000.
Ohara, Tsunemasa; Suzuki, Masayuki; and Yamamichi, Masayoshi, to Canon Kabushiki Kaisha. Single lens reflex camera. 4,508,439, Cl. 354-154.000.
O'Hare, Louis R. Self actuating diaphragm pump. 4,508,493, Cl. 417-379.000.
Ohashi, Kazuo, to Kabushiki Kaisha Patine Shokai. Boot containing ventilation means. 4,507,880, Cl. 36-115.000.
Ohkubo, Takashi: *See*—
Nishiwaki, Kenichiro; Sakai, Tomio; and Ohkubo, Takashi, 4,508,885, Cl. 526-318.000.
Ohkuma, Hiroaki: *See*—
Hatori, Masami; Ohkuma, Hiroaki; Konishi, Masataka; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,508,647, Cl. 260-239.30T.
Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Line guide. 4,507,891, Cl. 43-24.000.
Ohnishi, Kouhei; Ashikaga, Tadashi; and Terashima, Masayuki, to Kabushiki Kaisha Meidensha. Vector control method and system for an induction motor. 4,509,003, Cl. 318-800.000.
Ohno, Junichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for making complementary MOS semiconductor devices. 4,507,846, Cl. 29-571.000.
Ohno, Shigeru; and Kishimoto, Shinzo, to Fuji Photo Film Co., Ltd. Method of color photographic processing. 4,508,817, Cl. 430-393.000.
Ohsawa, Zenichi: *See*—
Sogo, Hiroyuki; Ohsawa, Zenichi; Umino, Isamu; and Nishida, Haruki, 4,509,208, Cl. 455-317.000.
Ohshima, Ken; and Sakamoto, Masaharu, to Olympus Optical Co., Ltd. System for checking defects on a flat surface of an object. 4,508,450, Cl. 356-237.000.
Ohtagawa, Kozi: *See*—
Inaga, Hisashi; and Ohtagawa, Kozi, 4,507,865, Cl. 30-276.000.
Ohtsuki, Etsuo: *See*—
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, 4,508,680, Cl. 419-5.000.
Okabe, Kazuo: *See*—
Miura, Yasuki; Motegi, Masahiko; and Okabe, Kazuo, 4,508,782, Cl. 428-409.000.
Okabe, Mitsuyasu: *See*—
Kubo, Katsuro; Yoshioka, Takeo; Okabe, Mitsuyasu; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,508,648, Cl. 260-245.20T.
Okada, Kazuo, to Kabushiki Kaisha Universal. Slot machine with player-friendly bonus game. 4,508,345, Cl. 273-143.00R.
Okada, Seizo: *See*—
Horigome, Koichi; Okada, Seizo; Nishimura, Katsuji; and Yamamoto, Hachizou, 4,509,136, Cl. 364-900.000.
Okada, Takashi: *See*—
Fujimura, Yasushi; Okada, Takashi; Tanaka, Yutaka; and Ikeda, Yasunari, 4,509,071, Cl. 358-11.000.
Okamura, Kenji; Nagaishi, Hatsuo; Kitahara, Tsuyoshi; Sone, Kohki; and Nakamura, Koyo, to Nissan Motor Company, Limited. Control system for motor vehicle. 4,507,986, Cl. 74-866.000.
Okano, Kinpei: *See*—
Doi, Motomichi; Okano, Kinpei; Nii, Katsutoshi; and Yokota, Yoshiharu, 4,508,396, Cl. 384-463.000.
Okawachi, Yukinori: *See*—
Sato, Mineo; Kawaguchi, Tadaaki; Okawachi, Yukinori; and Funahashi, Yasuyuki, 4,507,940, Cl. 62-407.000.

Okazaki, Nobuo, to Shimadzu Corporation. Apparatus for measuring diamond colors. 4,508,449, Cl. 356-30.000.
Okin, Kenneth: *See—*
Manton, John C.; Okin, Kenneth; and Zacconi, Anthony N., 4,509,115, Cl. 364-200.000.
Oktan Aktiebolag: *See—*
Buggert, Peter O., 4,508,070, Cl. 123-193.0CP.
Olah, George A., to El Paso Products Company. Increasing the octane number of natural gasoline with trifluoromethanesulfonic acid. 4,508,618, Cl. 208-134.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., to Mobil Oil Corporation. Multi-stage process for demetalation, desulfurization and dewaxing of petroleum oils. 4,508,615, Cl. 208-89.000.
Olig, Eugene A.; and Ladwig, Lee R., to AMCA International Corporation. Adaptive control for machine tools. 4,509,126, Cl. 364-474.000.
Olin Corporation: *See—*
Kaczur, Jerry J.; Iacoviello, Steven A.; and Miller, Edward G., 4,508,602, Cl. 204-95.000.
Winter, Joseph; and Pryor, Michael J., 4,508,423, Cl. 350-96.230.
Olsen, Ronald H., to Microlife Technics, Inc. Gene splicing method and products produced therefrom. 4,508,823, Cl. 435-172.300.
Olsen, Ronald H., to Microlife Technics, Inc. Pseudomonas degradation of hydrocarbons. 4,508,824, Cl. 435-172.300.
Olsen, Ronald H., to Microlife Technics, Inc. Molecular cloning vectors for use in gram-negative bacteria. 4,508,827, Cl. 435-253.000.
Olson, David H.: *See—*
Haag, Werner O.; Olson, David H.; and Rodewald, Paul G., 4,508,836, Cl. 502-53.000.
Olson, David V. Tool caddy. 4,508,221, Cl. 206-379.000.
Olson, Roger; and Versic, Ronald J., to Nova Tran Corporation. Method and apparatus for microencapsulation. 4,508,760, Cl. 427-213.340.
Olympus Optical Co., Ltd.: *See—*
Matsuzaki, Minoru; Hachimoto, Akihiko; Inoue, Takashi; Shirai, Hitoshi; Watanabe, Akira; and Tofukuji, Ikuo, 4,508,443, Cl. 354-402.000.
Nishio, Tadashi, 4,508,332, Cl. 271-118.000.
Ohshima, Ken; and Sakamoto, Masaharu, 4,508,450, Cl. 356-237.000.
Saito, Shoichi, 4,509,085, Cl. 360-93.000.
Omiya, Takeo, to Daicel Chemical Industris Ltd. Acid-type carboxymethyl cellulose and process for preparing the same. 4,508,894, Cl. 536-89.000.
Omura, Koichi; and Yuasa, Hiroyoshi, to Matsushita Electric Works, Ltd. Method and apparatus for speech message recognition. 4,509,186, Cl. 381-43.000.
O'Neill, Hector C. Security safety cradle. 4,508,219, Cl. 206-319.000.
Ono, Kinichi: *See—*
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,509,064, Cl. 346-207.000.
Onuki, Akio: *See—*
Fujioka, Yoshiharu; Onuki, Akio; and Sakamoto, Tomio, 4,509,084, Cl. 360-84.000.
Onuma, Kazuhiko; Kageyama, Yoichi; Kobayashi, Hiromu; Matsuki, Akihiro; and Suzuki, Makoto, to Mitsubishi Chemical Industries, Ltd.; and Asia Oil Company, Limited. Process for producing porous refractory inorganic oxide products. 4,508,841, Cl. 502-73.000.
Oose, Seiroku: *See—*
Suzuki, Koichi; Oose, Seiroku; So, Yuzo; and Hirao, Yasutaka, 4,509,104, Cl. 362-32.000.
Ordidge, Roger J.; and Mansfield, Peter. Nuclear magnetic resonance methods. 4,509,015, Cl. 324-309.000.
Oreopoulos, Dimitrios G.; Zellerman, Gabor, deceased; and by Price, Robert G., administrator. Connector. 4,508,367, Cl. 285-3.000.
Ort, Donald L.: *See—*
Sohl, Gordon; Ort, Donald L.; and Leicht, John R., 4,509,057, Cl. 346-1.100.
Orton, J. Berkeley. Apparatus for cleaning paint rollers. 4,508,465, Cl. 401-11.000.
Osborg, Hans. Process for preparing hydrazines. 4,508,695, Cl. 423-407.000.
Oseto, Osamu; and Moriuchi, Fumio, to Arakawa Kagaku Kogyo Kabushiki Kaisha. Electrophotographic toner composition. 4,508,806, Cl. 430-109.000.
Oshima, Yoshimasa: *See—*
Hara, Yasuhiko; Akiyama, Nobuyuki; Fushimi, Satoru; Oshima, Yoshimasa; and Aoki, Nobuhiko, 4,508,453, Cl. 356-394.000.
Oshima, Yutaka, to Nippon Gakki Seizo Kabushiki Kaisha. Process for producing ivorylike material for keys of musical instruments. 4,508,575, Cl. 106-148.000.
Oshio, Shuzo: *See—*
Kobayashi, Koichi; Kawashima, Kenichi; and Oshio, Shuzo, 4,508,968, Cl. 250-441.100.
Osterholt, Gerd: *See—*
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, 4,508,596, Cl. 202-227.000.
Otis Engineering Corporation: *See—*
Foust, Tommy C., 4,508,165, Cl. 166-117.500.
Otobe, Yutaka: *See—*
Yasuoka, Akimasa; and Otobe, Yutaka, 4,508,087, Cl. 123-493.000.
Ott, Rudi; and Reith, Heribert, to Robert Bosch GmbH. Method and apparatus for regeneration of a copper-containing etching solution. 4,508,599, Cl. 204-10.000.
Otto, William C.; and Daugherty, Norman E., to E.M.B. Corporation. Current operated miniature relay. 4,509,027, Cl. 335-201.000.
Ottosen, Richard A.: *See—*
Roberts, Michael K.; Ottosen, Richard A.; and McConnell, Matthew L., 4,507,968, Cl. 73-626.000.
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Niitti, Timo U.; and Niskala, Alvar M., 4,508,619, Cl. 209-169.000.
Ovard, John C. Self-locking mist eliminator. 4,508,552, Cl. 55-440.000.
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Simms, R. John; and Haney, Jerry D., 4,509,075, Cl. 358-106.000.
Oxo Welding Equipment Co., Inc.: *See—*
Kroll, Robert E., 4,508,954, Cl. 219-132.000.
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Yuki, Katsumi; Yoshida, Susumu; Ozeki, Mineo; Miyazaki, Yasuyuki; and Kawamata, Masaru, 4,509,127, Cl. 364-478.000.
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Packard, Gary R.; and Mower, Michael L., to Facet Enterprises, Incorporated. Plastic bobbin for electromagnetic clutch. 4,508,203, Cl. 192-84.00C.
Packet Technologies, Inc.: *See—*
Baran, Paul; and Pranger, Maarten R., 4,509,073, Cl. 358-86.000.
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Page, David W.; and Peterson, LuVerne R., to Burroughs Corporation. Re-programmable PLA. 4,508,977, Cl. 307-468.000.
Pages, Gerard, to Le Joint Francais. Sealing pad for musical instrument. 4,508,004, Cl. 84-385.00P.
Pall Corporation: *See—*
Adiletta, Joseph G., 4,508,775, Cl. 428-240.000.
Palmer, David N., to Combustion Engineering, Inc. Method for making chalcogenide cathodes. 4,508,608, Cl. 204-192.00C.
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Bremer, Gordon; and Betts, William L., 4,509,171, Cl. 370-100.000.
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Redziniak, Gerard; and Meybeck, Alain, 4,508,703, Cl. 424-38.000.
Parg, Adolf: *See—*
Acker, Rolf-Dieter; Parg, Adolf; and Wuerzer, Bruno, 4,508,915, Cl. 556-418.000.
Parker, David: *See—*
Churchland, Mark T.; and Parker, David, 4,508,772, Cl. 428-106.000.
Parker, Norman W., to Motorola, Inc. Cosine signal correction circuit. 4,509,135, Cl. 364-826.000.
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Spivack, John D.; and Pastor, Stephen D., 4,508,865, Cl. 524-283.000.
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Wurster, Ewald; and Heidemann, Albert, 4,508,991, Cl. 313-579.000.
Patil, Ghanshyam: *See—*
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Patterson, Billy R.; and Schneider, Warren P., to Lone Star Steel Company. Tubular connection. 4,508,375, Cl. 285-334.000.
Paul Forkardt GmbH & Co. KG: *See—*
Reich, Kurt, 4,508,357, Cl. 279-1.00C.
Paul, Gerald T.: *See—*
Kornely, Edward B.; and Paul, Gerald T., 4,508,768, Cl. 428-35.000.

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Plaschka, Emil; Pauls, Mathias; and Niggli, Guido, 4,508,244, Cl. 222-153.000.

Pavlath, Attila E.: *See—*
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Tinker, Charles L., 4,508,486, Cl. 415-119.000.

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Pearson, Kenneth C., to Hartco Company. U-Clip assembly and method of producing and utilizing the same. 4,508,220, Cl. 206-343.000.

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Keir, Grant G. H.; Peebles, John A.; McNab, Jonas K.; and Campbell, Ian N., 4,508,260, Cl. 232-43.100.

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Marchetti, Renato; and Penco, Eugenio, 4,509,176, Cl. 372-86.000.

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Perdiz, Antonio L. Collapsible hairbrush. 4,507,818, Cl. 15-203.000.

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Perkins, Gary M. Indoor-outdoor convertible cooker. 4,508,024, Cl. 99-340.000.

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Letoffe, Michel; Favre, Roger; and Perrin, Patrice, 4,508,888, Cl. 528-23.000.

Perry, Richard W.: *See—*
Steinert, Leopold A.; and Perry, Richard W., 4,507,840, Cl. 29-401.100.

Personal Products Company: *See—*
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Peter, Anton: *See—*
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Peters, John F.: *See—*
Smith, Christopher G.; and Peters, John F., 4,508,856, Cl. 523-218.000.

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Allgood, Robert N.; Peterson, Joe W.; and Whatley, Roger A., 4,508,983, Cl. 307-577.000.

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Petrolite Corporation: *See—*
Heintzelman, William J.; and Godar, Richard L., 4,508,637, Cl. 252-396.000.

Petrucelli, Frank: *See—*
Salatiello, Peter P.; Petrucelli, Frank; and Flood, Paul W., 4,508,675, Cl. 264-310.000.

Peuterbaugh, Bruce G., to J. P. Tool. Boring and grooving tool structure and method. 4,508,475, Cl. 408-153.000.

Peyre, Henri: *See—*
Beyl, Jean; Bernard, Jean; Guerreau, Rene ; le Faou, Daniel; and Peyre, Henri, 4,508,360, Cl. 280-605.000.

Peyronel, Jean-Francois: *See—*
Berger, Christian; Farge, Daniel; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,508,717, Cl. 514-203.000.

Peyton, John J.; and Watt, Bryan K., to Industrial Automation Corp. Optical system for automatic sorting and inspection equipment. 4,509,081, Cl. 358-225.000.

Pfaff Industriemaschinen GmbH: *See—*
Vollmar, Kurt, 4,508,043, Cl. 112-235.000.

Pfeiffer, James W.; and Corder, Thomas E., to Security Switch, Ltd. Wall command switch. 4,508,943, Cl. 200-17.00R.

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Karlsson, Lars, 4,508,422, Cl. 350-6.800.

Philipp, Wilfred. Gravure press. 4,508,032, Cl. 101-163.000.

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Chen, Tsu F.; and Phillips, Edwin R., 4,507,834, Cl. 29-26.00R.

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Alexandrovich, George; Edinger, J. Raymond; Hofer, Alan; and Kuykendall, John, 4,509,159, Cl. 369-170.000.

Pickering, William: *See—*
Melocik, Grant C.; and Pickering, William, 4,508,999, Cl. 318-331.000.

Pieczykolan, George S., to Central Sprinkler Corporation. Flush pendant or flush horizontal automatic sprinkler head. 4,508,175, Cl. 169-38.000.

Pierantozzi, Ronald, to Air Products and Chemicals, Inc. Ruthenium carbonyl catalyst supported on ceric oxide for preparation of olefins from synthesis gas. 4,508,846, Cl. 502-174.000.

Pierburg GmbH & Co. KG: *See—*
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Pierrel S.p.A.: *See—*
Tricerri, Silvia Z.; Casagrande, Cesare; De Marchi, Franco; and Nicola, Massimo, 4,508,719, Cl. 514-236.000.

Pietzarka, Wilhelm F.; Malten, Albrecht; and Strauss, Georg, to Hoechst Aktiengesellschaft. Process for cooling and comminuting molten calcium carbide. 4,508,666, Cl. 264-12.000.

Piezo Electric Products, Inc.: *See—*
Kolm, Henry H.; and Kolm, Eric A., 4,508,994, Cl. 315-200.00R.

Pikna, Richard G., to Logan Industries & Services, Inc. Well pump controller. 4,508,488, Cl. 417-12.000.

Pinckney Molded Plastics, Inc.: *See—*
Kreeger, Elsmer W.; and Stahl, Edward L., 4,508,237, Cl. 220-6.000.

Pinson, George T., to Boeing Company, The. Multiple annulus energy storage system. 4,509,006, Cl. 322-4.000.

Pinto, Akiva: *See—*
Keller, Alex J.; and Pinto, Akiva, 4,507,826, Cl. 19-80.00R.

Pioneer Electronic Corporation: *See—*
Yanagawa, Hirofumi, 4,509,184, Cl. 381-24.000.

Pioneer Video Corporation: *See—*
Kuroda, Kazuo, 4,509,078, Cl. 358-160.000.

Pirzer Co.: *See—*
Jorss, Norbert, 4,508,330, Cl. 271-33.000.

Pisarski, Lech: *See—*
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Pitney Bowes Inc.: *See—*
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Plan Hold Corporation: *See—*
Johnson, Sigurd A.; Avella, Frank S.; and Jones, Robert I., 4,508,305, Cl. 208-455.000.

Plaschka, Emil; Pauls, Mathias; and Niggli, Guido, to Polypag A.G. Pressure can for application of mounting foams, in particular, single-component polyurethane foams. 4,508,244, Cl. 222-153.000.

Plassor Maagan Michael Industries Ltd.: *See—*
Kantor, Itzhak, 4,508,374, Cl. 285-319.000.

Plater, Robert J., to TSE International. Hydraulic drive system for cable stringing apparatus. 4,508,281, Cl. 242-54.00R.

Plath, Jurgen: *See—*
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Berger, Christian; Farge, Daniel; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,508,717, Cl. 514-203.000.

Plough, Inc.: *See—*
Pawelek, John M.; and Agin, Patricia P., 4,508,706, Cl. 424-60.000.

Ploussios, George. Multi-frequency antenna employing tuned sleeve chokes. 4,509,056, Cl. 343-791.000.

Plunkett, James D.: *See—*
Kavanagh, Frank J.; Plunkett, James D.; and DePalma, Bernard F., 4,507,801, Cl. 2-2.000.

Pneumo Corporation: *See—*
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Pohl, Siegfried: *See—*
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Poklacki, Erwin S.: *See—*
Noren, Gerry K.; Poklacki, Erwin S.; Hawker, Fred D.; and Sich, Janice M., 4,508,889, Cl. 528-28.000.

Polar-Plastik HB: *See—*
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Polaroid Corporation: *See—*
Costa, Peter F.; and Whiteside, George D., 4,508,440, Cl. 354-187.000.
Eburn, William H., Jr.; and Kalenik, Stephen P., 4,508,142, Cl. 137-625.400.
Johnson, Bruce K., 4,508,437, Cl. 354-78.000.

Launie, Kenneth J., 4,508,441, Cl. 354-217.000.

Polaschegg, Hans-Dietrich; and Husar, Dieter, to Fresenius AG. Dialysis apparatus with regulated mixing of the dialysis solution. 4,508,622, Cl. 210-96.200.

Polypag A.G.: *See—*
Plaschka, Emil; Pauls, Mathias; and Niggli, Guido, 4,508,244, Cl. 222-153.000.

Polysar Limited: *See—*
Lee, Ivan S., 4,508,864, Cl. 524-187.000.
Sato, Kyosaku, 4,508,867, Cl. 524-434.000.

Pontif, Marc: *See—*
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Poortman, Boudewijn J.: *See—*
Bittner, Franz; Poortman, Boudewijn J.; Rademacher-Dubbick, Kristian; Roskam, Abram K.; Stevens, Udo; and Tromp, Wouter T., 4,507,975, Cl. 73-861.120.

Post, Lothar; and Schneider, Bernhard, to Rheinmetall GmbH. Device for quickly stopping a remote controlled automatic cannon. 4,508,006, Cl. 89-24.000.

Post, Sieghard, to U.S. Philips Corporation. Mains transformer. 4,509,032, Cl. 336-59.000.

PPG Industries, Inc.: *See—*
Bennett, Terry A.; Claassen, George R. Zimmerman, William B., 4,508,556, Cl. 65-25.400.
Gillery, F. Howard; and Criss, Russell C., 4,508,789, Cl. 428-630.000.
Hodek, Robert B.; and Seiner, Jerome A., 4,508,646, Cl. 260-239.30R.

PQ Corporation: *See—*
McLaughlin, John R.; and Hertzenberg, Elliot P., 4,508,742, Cl. 426-330.400.
Smith, Christopher G.; and Peters, John F., 4,508,856, Cl. 523-218.000.

Prahl, Marvin E.: *See—*
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Pranger, Maarten R.: *See—*
Baran, Paul; and Pranger, Maarten R., 4,509,073, Cl. 358-86.000.

Precision Strip, Inc.: *See—*
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Preedy, John R., to Thos. Hill & Company Limited. Apparatus and method for moving materials. 4,508,208, Cl. 198-751.000.

Preston Engravers, Inc.: *See—*
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Pribyl, Richard: *See—*
Fidi, Werner; Pribyl, Richard; and Wolf, Konrad, 4,508,192, Cl. 181-158.000.

Price, Anthony G.: *See—*
Gornall, Graham J.; Price, Anthony G.; and Parry, David, 4,508,198, Cl. 188-71.400.

Price, John F.: *See—*
Matzner, Bruce, Horn, Victor M.; Curulla, Michael V.; and Price, John F., 4,508,679, Cl. 376-438.000.

Price, Robert G., administrator: *See—*
Oreopoulos, Dimitrios G.; Zellerman, Gabor, deceased; and Price, Robert G., administrator, 4,508,367, Cl. 285-3.000.

Prichard, Arthur W., to USM Corporation. Heat device for heating portions of shoe uppers. 4,508,956, Cl. 219-215.000.

Primat, Didier: *See—*
Lambert, Johnny H.; Primat, Didier; Edmiston, William H.; Edmiston, Johnny J.; and Edmiston, James H., 4,507,998, Cl. 83-419.000.

Primlumber, Inc.: *See—*
Lambert, Johnny H.; Primat, Didier; Edmiston, William H.; Edmiston, Johnny J.; and Edmiston, James H., 4,507,998, Cl. 83-419.000.

Probex, Inc.: *See—*
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Procter & Gamble Company, The: *See—*
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Duncan, David T.; Lipscomb, David M.; McElligott, John; and Williams, Charles W., 4,508,116, Cl. 128-203.280.

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Profio, Mark V., to Square D Company. Motor protector relay with memory of overload. 4,509,088, Cl. 361-29.000.

Proprietary Technology, Inc.: *See—*
Bartholomew, Donald D., 4,508,234, Cl. 215-206.000.

Proter S.p.A.: *See—*
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Prucher, Helmut: *See—*
Hausberg, Hans-Heinrich; Prucher, Helmut; Uhl, Jurgen; Seyfried, Christoph; and Minck, Klaus, 4,508,732, Cl. 514-466.000.

Pruett, Roy L.: *See—*
Doyle, Gerald; Pruett, Roy L.; and Savage, David W., 4,508,694, Cl. 423-246.000.

Prymak, John D., to AVX Corporation. Low dissipation factor monolithic capacitor for high frequency applications. 4,509,103, Cl. 361-321.000.

Pryor, Michael J.: *See—*
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Puar, Deepraj S., to Signetics Corporation. Sense and refresh amplifier circuit. 4,508,980, Cl. 307-530.000.

Pullman Standard, Inc.: *See—*
Rousseau, George L., 4,508,037, Cl. 105-290.000.

PUMA-Sportschuhfabriken Rudolk Dassler KG: *See—*
Dassler, Armin, 4,507,879, Cl. 36-102.000.

Punchak, Kathleen. Ampoule breaker tool. 4,508,250, Cl. 225-97.000.

Puppolo, Henry F., to Sprague Electric Company. Low inductance wound capacitor. 4,509,100, Cl. 361-433.000.

Purcocks, Dale M. Concealable handle with a slidable pivot. 4,507,820, Cl. 16-125.000.

Purvis, Merton B.: *See—*
DasGupta, Sujan; and Purvis, Merton B., 4,509,098, Cl. 361-398.000.

Puydak, Robert C.: *See—*
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Pyromid, Inc.: *See—*
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Quantronix Corporation: *See—*
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Queen's University at Kingston: *See—*
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Quixote Corporation: *See—*
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R & G Sloane Mfg. Co., Inc.: *See—*
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R&H Technology, Inc.: *See—*
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R. J. Reynolds Tobacco Company: *See—*
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Rabold, Karl: *See—*
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Radel, Clifford J.; and Thompson, Hugh A., to Procter & Gamble Company, The. Method of constructing a three dimensional tubular member. 4,508,256, Cl. 228-152.000.

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Bittner, Franz; Poortman, Boudewijn J.; Rademacher-Dubbick, Kristian; Roskam, Abram K.; Stevens, Udo; and Tromp, Wouter T., 4,507,975, Cl. 73-861.120.

Radtke, Manfred, to Mero-Werke Dr.-Ing. Max Mengeringhausen GmbH & Co. Double floor. 4,508,162, Cl. 165-56.000.

Rajnik, Lawrence S., to Corning Glass Works. Flexible membrane printing apparatus for a decorating machine. 4,508,031, Cl. 101-41.000.

Ramcke, Bernd; and Stahl, Gunther, to E.C.H. Will (GmbH & Co.). Apparatus for transporting paper stacks or the like. 4,508,210, Cl. 198-627.000.

Ramesohl, Hubert; Seelen, Fritz; Filges, Ralf; Schroder, Karlheinz; and Veiser, Elmar, to Klockner-Humboldt-Deutz AG. Intake assembly for rotary drums. 4,508,503, Cl. 432-109.000.

Ramirez, Joe D.; Gorin, Steven E.; and Garnett, William A., to United States of America, Navy. Two stage manual air pump. 4,508,490, Cl. 417-234.000.

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Saito, Eiiji; Aizawa, Shoji; Mitsui, Michio; Miyata, Tomohiko; and Kuroda, Masayuki, 4,508,266, Cl. 239-3.000.

Rasch, Ulf: *See—*
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Rasmussen, Robert A.: *See—*
DasGupta, Sumit; Graf, Matthew C.; Rasmussen, Robert A.; and Williams, Thomas W., 4,509,008, Cl. 324-73.00R.

Rattmann, Hans R.: *See—*
Oehlke, Donald N.; MacRae, Ralph A.; Crammond, James; and Rattmann, Hans R., 4,508,477, Cl. 411-174.000.

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Rau, Jim L., to TRW Inc. Steering control apparatus. 4,507,920, Cl. 60-443.000.

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Kimpel, Rolf-Dieter; Rauterberg, Ulf; and Tamm, Horst, 4,509,025, Cl. 335-85.000.

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Palmer, John; Ravenel, Bruce; and Nave, Rafi, 4,509,144, Cl. 364-900.000.

Raytheon Company: *See—*
Fassett, Matthew, 4,509,055, Cl. 343-754.000.
Heeren, Vernon L., 4,508,168, Cl. 166-248.000.

RCA Corporation: *See—*
Berardi, Randal L., 4,507,873, Cl. 33-180.00R.
Kohn, Elliott S., 4,509,210, Cl. 455-349.000.
Lagoni, William A.; and Harlan, Wayne E., 4,509,080, Cl. 358-166.000.
Rockett, Leonard R., Jr., 4,508,975, Cl. 307-261.000.
Sauer, Donald J., 4,509,181, Cl. 377-63.000.

Read, Norman W., to Dresser Industries, Inc. Flow control valve for use on oil and gas wells or the like. 4,508,173, Cl. 166-330.000.

Reddy, Chitranjan N., to Texas Instruments Incorporated. Reduction of gate oxide breakdown for booted nodes in MOS integrated circuits. 4,508,978, Cl. 307-482.000.

Redziniak, Gerard; and Meybeck, Alain, to Parfums Christian Dior. Production of pulverulent mixtures of lipidic and hydrophobic constituents. 4,508,703, Cl. 424-38.000.
Reed, Nanci W.: *See—*
Guimond, Roy A.; Gulliksen, John E.; and Reed, Nanci W., 4,508,801, Cl. 429-238.000.
Reed, Robert L., to Standard Oil Company (Indiana). Process and system for producing and recovering elemental sulfur. 4,508,698, Cl. 423-574.00R.
Reese, Dieter: *See—*
Johnson, Frank; Reese, Dieter; and Hirbour, Louis, 4,508,611, Cl. 204-202.000.
Reeves, Russell R., to Apace Research Limited. Emulsions of liquid hydrocarbons with water and/or alcohols. 4,508,873, Cl. 525-91.000.
Regenbrecht, Dougias E.: *See—*
Lester, James M.; Reinker, Richard P.; and Regenbrecht, Douglas E., 4,507,941, Cl. 62-514.00R.
Rehrig, Richard B.: *See—*
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Reich, Kurt, to Paul Forkardt GmbH & Co. KG. Power-operated chuck for turning machines. 4,508,357, Cl. 279-1.00C.
Reichenbach, Donald F.: *See—*
Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, 4,508,785, Cl. 428-424.400.
Reinehr, Ulrich; Herbertz, Toni; and Jungverdorben, Hermann-Josef, to Bayer Aktiengesellschaft. Continuous dry-spinning process for highly shrinkable acrylonitrile filaments and fibers. 4,508,672, Cl. 264-78.000.
Reinhardt, Jurgen: *See—*
Krauss, Peter; Reinhardt, Jurgen; and Seissl, Johann, 4,509,074, Cl. 358-111.000.
Reinke Manufacturing Co., Inc.: *See—*
Davis, John E.; Zielke, Terry L.; and Coash, Ronald J., 4,508,269, Cl. 239-177.200.
Reinker, Richard P.: *See—*
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Reiss, Leon G.; and Schultz, Roy D., to Kollmorgen Technologies Corporation. Permanent magnet motor stator for d.c. motors. 4,508,988, Cl. 310-154.000.
Reith, Heribert: *See—*
Ott, Rudi; and Reith, Heribert, 4,508,599, Cl. 204-10.000.
Rembold, Helmut, to Robert Bosch GmbH. Method and apparatus for controlling the supercharger of an internal combustion engine. 4,508,090, Cl. 123-564.000.
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Levesque, Adelard, Jr.; and Rembold, John P., 4,509,110, Cl. 364-153.000.
Remond, Georges: *See—*
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,508,729, Cl. 514-419.000.
Renaud, Maurice, to Renaud, Maurice. T-assembly and method of obtaining same. 4,507,844, Cl. 29-522.00R.
Rengo Co., Ltd.: *See—*
Tokuno, Masateru; and Sawata, Tetsuya, 4,508,279, Cl. 242-56.00R.
Renken, Johannes W.: *See—*
van Dijk, Jacob; Renken, Johannes W.; Dekker, Jan G.; and Helmond, Johannes, 4,508,652, Cl. 260-407.000.
Renner, Robert E., to GTE Automatic Electric Inc. Digital remote switching unit. 4,509,168, Cl. 370-63.000.
Renner, Robert E., to GTE Automatic Electric Inc. Dual rail network for a remote switching unit. 4,509,169, Cl. 370-63.000.
Repa Feinstanzwerk GmbH: *See—*
Seifert, Helmut; and Mondel, Karl, 4,508,286, Cl. 242-107.000.
Republic Steel Corporation: *See—*
Killilea, Daniel E., 4,507,949, Cl. 72-201.000.
Research Corporation: *See—*
Carpino, Louis A.; and Cohen, Beri, 4,508,657, Cl. 260-463.000.
Rester, Marshall D., to Quixote Corporation. High density recording medium. 4,509,162, Cl. 369-275.000.
Rey, Thomas J.; and Forbes, Ervin, to Honeywell Information Systems Inc. Apparatus for synchronizing a stream of data bits received over a single coaxial conductor. 4,509,121, Cl. 364-200.000.
Reynolds, Desmond H. J.; and Taft, Phillip A., to Lucas Industries Public Limited Company. High pressure hydraulic systems. 4,508,012, Cl. 91-512.000.
Rheinmetall GmbH: *See—*
Elspass, Marold, 4,508,007, Cl. 89-37.110.
Post, Lothar; and Schneider, Bernhard, 4,508,006, Cl. 89-24.000.
Rheometron AG: *See—*
Bittner, Franz; Poortman, Boudewijn J.; Rademacher-Dubbick, Kristian; Roskam, Abram K.; Stevens, Udo; and Tromp, Wouter T., 4,507,975, Cl. 73-861.120.
Rhone-Poulenc Agrochimie: *See—*
Ratton, Serge, 4,508,922, Cl. 564-407.000.
Rhone-Poulenc Chimie de Base: *See—*
Jenck, Jean, 4,508,917, Cl. 560-204.000.
Rhone-Poulenc Sante: *See—*
Berger, Christian; Farge, Daniel; Moutonnier, Claude; Peyronel, Jean-Francois; and Plau, Bernard, 4,508,717, Cl. 514-203.000.
Petre, Dominique; and Michelet, Daniel, 4,508,902, Cl. 546-153.000.
Rhone-Poulenc Specialites Chimiques: *See—*
Dromard, Adrien; and Millet, Claude, 4,508,845, Cl. 502-159.000.
Letoffe, Michel; Favre, Roger; and Perrin, Patrice, 4,508,888, Cl. 528-23.000.
Rhovyl: *See—*
Achard, Georges, 4,508,778, Cl. 428-364.000.
Rhyner, Fritz, to Maag Gear-Wheel & Machine Company Limited. Circuit for connecting a process computer by means of a number of analog channels with a machine tool. 4,509,047, Cl. 340-825.230.
Rice, Ivan G. Steam cooled gas generator. 4,507,914, Cl. 60-39.170.
Richards, Donald L.: *See—*
Schlesinger, Lawrence; German, Dale F.; and Richards, Donald L., 4,507,956, Cl. 73-146.500.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,508,926, Cl. 568-766.000.
Richter, Ole J.; and Funk, Erwin D., to Kamyr, Inc. Simple dry feeder. 4,508,473, Cl. 406-64.000.
Rickert, Robert E., to Vista Polymers Inc. Removal and reinstallation of bottom entering agitator seals. 4,507,841, Cl. 29-402.080.
Ricoh Company, Ltd.: *See—*
Fujii, Tadashi; Yamaguchi, Tomoyuki; Murakami, Kakuji; Kawakami, Tomiko; and Uenozono, Hiroko, 4,508,570, Cl. 106-20.000.
Imai, Chikara, 4,508,446, Cl. 355-14.00R.
Iwanaga, Yoshiharu, 4,508,334, Cl. 271-308.000.
Uozumi, Osamu, 4,509,060, Cl. 346-76.0PH.
Ridel, Philippe, to U.S. Philips Corporation. Amplifier circuit with automatic gain control and hearing aid equipped with such a circuit. 4,509,022, Cl. 330-284.000.
Ridgeon, Paul W., to Walkover Limited. Wheeled applicator for liquids. 4,508,248, Cl. 222-623.000.
Riebli, Peter; Fischer, Hanspeter; Thummel, Rudolph C.; and Hubele, Adolf, to Ciba Geigy Corporation. Microbicidal N-(tetrahydro-2-onfur-3-yl)-N-substituted acetyl-anilines and -naphthylamines. 4,508,731, Cl. 514-472.000.
Riegel, Hans: *See—*
Finkelstein, Wolfgang; and Riegel, Hans, 4,508,022, Cl. 98-40.120.
Riemath, William F.: *See—*
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Rieter Machine Works Ltd.: *See—*
Staehli, Urs, 4,507,827, Cl. 19-200.000.
Rigbey, Leonard J.: *See—*
MacWilliams, David; and Rigbey, Leonard J., 4,508,204, Cl. 193-40.000.
Riggers Manufacturing Co.: *See—*
Lampson, Neil F., 4,508,232, Cl. 212-178.000.
Rimmeir, Paul. Device for removing portion of a roll and method of using same. 4,507,866, Cl. 30-316.000.
Ring, John; French, David; Hickling, Michael; and Sturgess, Michael G., to International Paint public limited company. Synthetic resins and coating compositions containing them. 4,508,765, Cl. 427-386.000.
Rinnai Corporation: *See—*
Itoh, Jiro, 4,508,502, Cl. 431-328.000.
Rittal-CSM Limited: *See—*
Erlam, David P., 4,508,228, Cl. 211-41.000.
Roach, Jack W., to Kerr-McGee Refining Corporation. Recovery of organic solvents from liquid mixtures. 4,508,597, Cl. 203-79.000.
Robbins, Michael S., to Xantech Corporation. Infrared extension system. 4,509,211, Cl. 455-603.000.
Robert Bosch GmbH: *See—*
Becker, Wolfram; and Denz, Helmut, 4,508,082, Cl. 123-478.000.
Hofmann, Karl; and Banzhaf, Werner, 4,508,275, Cl. 239-533.300.
Ott, Rudi; and Reith, Heribert, 4,508,599, Cl. 204-10.000.
Rembold, Helmut, 4,508,090, Cl. 123-564.000.
Steinmann, Helmut, 4,508,021, Cl. 98-2.010.
Weiss, Gunther; Worz, Paul; and Tomczak, Stanislaus, 4,509,033, Cl. 336-107.000.
Roberts, Clifford: *See—*
Nicholson, Timothy J. H.; Lee, Andrew L.; and Roberts, Clifford, 4,508,301, Cl. 248-250.000.
Roberts, Gary P.: *See—*
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Roberts, Michael G.: *See—*
Muncaster, John W.; Roberts, Michael G.; Rowlett, R. David; Hoitink, Todd B.; Uffner, William E.; and White, Robert N., 4,508,770, Cl. 428-63.000.
Roberts, Michael K.; Ottosen, Richard A.; and McConnell, Matthew L., to Bion Corporation. Ultrasound visualization systems. 4,507,968, Cl. 73-626.000.
Robin, Seymour; and Klein, Yosef, to Sensor Systems, Inc. Blade antenna with shaped dielectric. 4,509,053, Cl. 343-708.000.
Robinson, Larry G.; and King, Edward C., to King Design, Inc. Magnetic digital display sign. 4,507,888, Cl. 40-621.000.
Robinson, Larry G.: *See—*
Streeter, Bert E.; Streeter, Mary M.; and Robinson, Larry G., 4,507,886, Cl. 40-447.000.
Robinson, Ronnie D., to EECO Incorporated. Control unit individually serving two adjacent passengers. 4,509,097, Cl. 361-395.000.
Robotic Vision Systems, Inc.: *See—*
DiMatteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,508,452, Cl. 356-375.000.

Rocchitelli, Onofrio. Thermostatically controlled electric heating device for motor vehicle glass washing fluid. 4,508,957, Cl. 219-305.000.
Rochman, Zvi H. Door locking device. 4,508,378, Cl. 292-333.000.
Rock, Erich, to Julius Blum Gesellschaft m.b.H. Drawer guide assembly. 4,508,394, Cl. 308-3.800.
Rockett, Leonard R., Jr., to RCA Corporation. Pulse duration modulator using charge coupled devices. 4,508,975, Cl. 307-261.000.
Rockwell International Corporation: *See*—
Boros, John, 4,509,095, Cl. 361-386.000.
Gunning, William J., III; and Tracy, John M., 4,508,964, Cl. 250-201.000.
Haendel, Richard S.; and Wauer, John C., 4,509,049, Cl. 343-7.500.
Hawes, Debra K., 4,508,365, Cl. 281-2.000.
Karulkar, Pramod C., 4,507,852, Cl. 29-590.000.
Rodari, Gianpiero S., to Soxil S.p.A. Apparatus for artificial pulmonary ventilation during anaesthesia and resuscitation. 4,508,117, Cl. 128-204.210.
Rodewald, Paul G.: *See*—
Haag, Werner O.; Olson, David H.; and Rodewald, Paul G., 4,508,836, Cl. 502-53.000.
Rohm and Haas Company: *See*—
Kollman, Garald E., 4,508,559, Cl. 71-83.000.
Rohringer, Ernst, to Steuler-Industriewerke GmbH. Method for producing lining panels which are cast into concrete as an integral lining. 4,508,581, Cl. 156-73.100.
Rolfo, Andre A.: *See*—
Mouilhayrat, Guy G.; Duchon, Paul A. J.; Guilbert, Jean M. A. M.; and Rolfo, Andre A., 4,508,297, Cl. 244-173.000.
Romagnoli, Andrea, to IMA - Industria Macchine Automatiche S.p.A. Device for centering the printing of strip material for the automatic production of small filter bags for infusion products. 4,508,524, Cl. 493-11.000.
Romano, Ugo; and Iori, Giuseppe, to Anic, S.p.A. Process for synthesizing allyl carbonates of polyhydric alcohols and their derivatives. 4,508,656, Cl. 260-463.000.
Rosch, Gunter: *See*—
Schonberger, Norbert; Schinzel, Erich; Martini, Thomas; and Rosch, Gunter, 4,508,900, Cl. 546-99.000.
Rose, Sam, to Bio-Response, Inc. Method for culturing cells or tissues. 4,508,819, Cl. 435-1.000.
Roskam, Abram K.: *See*—
Bittner, Franz; Poortman, Boudewijn J.; Rademacher-Dubbick, Kristian; Roskam, Abram K.; Stevens, Udo; and Tromp, Wouter T., 4,507,975, Cl. 73-861.120.
Ross, Joseph A.: *See*—
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Ross, Ludwig: *See*—
Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,508,834, Cl. 501-73.000.
Ross, Peter W., to International Standard Electric Corporation. Liquid crystal display device. 4,508,427, Cl. 350-335.000.
Ross, Sidney D.: *See*—
Finkelstein, Manuel; and Ross, Sidney D., 4,509,094, Cl. 361-314.000.
Rossin, Ineo; and Zanella, Francesco, to Edilvelox S.R.L. Reinforcement structure for reinforced-concrete buildings. 4,508,308, Cl. 249-19.000.
Rotaflex p.l.c.: *See*—
Herbert, Tony E. G., 4,508,400, Cl. 339-22.00R.
Rousseau, Carl H. Apparatus for and method of obtaining improved dental castings. 4,508,155, Cl. 164-35.000.
Rousseau, George L., to Pullman Standard, Inc. Door lever adjusting device for hopper car doors. 4,508,037, Cl. 105-290.000.
Rousseau, Gerard, to Societe Nationale Industrielle Aerospatiale. Process for manufacturing a high-performance thermal performance material. 4,508,762, Cl. 427-228.000.
Rowe, Jerry D. Packsaw. 4,507,863, Cl. 30-166.00R.
Rowlett, R. David: *See*—
Muncaster, John W.; Roberts, Michael G.; Rowlett, R. David; Hoitink, Todd B.; Uffner, William E.; and White, Robert N., 4,508,770, Cl. 428-63.000.
Rowson, Graham P.; Percival, Albert; and Judson, Philip N., to FBC Limited. 2-Cyano-3-benzylamino-2-propenoates, useful as fungicides. 4,508,659, Cl. 260-465.00D.
Rozzen, David L. Toothpaste dispenser. 4,508,239, Cl. 222-39.000.
Rubensson, Bjorn: *See*—
Widen, Bo; and Rubensson, Bjorn, 4,507,944, Cl. 70-276.000.
Rudd, Wallace C., to Thermatool Corporation. Method and apparatus for welding tapered metal poles. 4,508,949, Cl. 219-61.200.
Ruder, Nils I. A. Binocular display of information with two combiner means. 4,508,424, Cl. 350-174.000
Ruehle, William H., to Mobil Oil Corporation. Directional long array for logging vertical boundaries. 4,509,149, Cl. 367-27.000.
Ruhland, Michael: *See*—
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,508,716, Cl. 514-220.000.
Ruhrgas Aktiengesellschaft: *See*—
Kuhn, Friedhelm, 4,508,501, Cl. 431-2.000.
Runglin Co. Inc.: *See*—
Steele, Edward J.; and Sexton, Rodney N., 4,508,235, Cl. 215-307.000.
Runions, Alton E.: *See*—
Mayer, William; and Runions, Alton E., 4,509,106, Cl. 362-267.000.
Runzler, Jurgen: *See*—
Hepfer, Rolf; and Runzler, Jurgen, 4,508,456, Cl. 368-262.000.
Ruoss, Erwin; and Sieber, Kurt, to Condair AG. Steam distributor. 4,508,551, Cl. 55-263.000.
Rush, David H.: *See*—
Hahn, James H., 4,508,998, Cl. 318-138.000.
Russell, Anthony W.; and Russell, Michael K., to NL Sperry-Sun, Inc. Surveying of a borehole for position determination. 4,507,958, Cl. 73-151.000.
Russell, Janet A.; and Riemath, William F., to United States of America, Energy. Method for making adhesive from biomass. 4,508,886, Cl. 528-1.000.
Russell, Michael K.: *See*—
Russell, Anthony W.; and Russell, Michael K., 4,507,958, Cl. 73-151.000.
Rutledge, Charles W.: *See*—
Menzies, Robert T.; and Rutledge, Charles W., 4,509,130, Cl. 364-556.000.
Ryan, Harriet E.; and Ryan, Linda A. Riding mittens. 4,507,803, Cl. 2-16.000.
Ryan, Linda A.: *See*—
Ryan, Harriet E.; and Ryan, Linda A., 4,507,803, Cl. 2-16.000.
Ryan, Philip J., to Frito-Lay, Inc. Potato product with opposite corrugations of different frequencies. 4,508,739, Cl. 426-144.000.
Rydwansky, Frank C., Jr.: *See*—
Damon, Neil F.; and Rydwansky, Frank C., Jr., 4,508,405, Cl. 339-75.0MP.
Ryerse, John A.: *See*—
Trechsel, Hans W.; Larson, Allan B.; and Ryerse, John A., 4,508,148, Cl. 141-147.000.
S.N.E.C.M.A.: *See*—
Cattaneo, Christian J.; Derouet, Patrick R. J.; and Laroche, Michel C. F., 4,508,295, Cl. 244-134.00A.
Joubert, Raymond J. M., 4,508,270, Cl. 239-265.350.
Safetran Systems Corporation: *See*—
Wilson, H. James, 4,509,024, Cl. 333-24.00R.
Saiji, Mitsuhiro, to Sharp Kabushiki Kaisha. Small programmable computer. 4,509,112, Cl. 364-200.000.
Saint-Gobain Vitrage: *See*—
Aubry, Claude; Chaumette, Jacques; and Touchon, Pierre, 4,508,783, Cl. 428-410.000.
Saito, Eiiji; Aizawa, Shoji; Mitsui, Michio; Miyata, Tomohiko; and Kuroda, Masayuki, to Ransburg Japan, Ltd. Method of changing color of paints for an electrostatic coating machine. 4,508,266, Cl. 239-3.000.
Saito, Shoichi, to Olympus Optical Co., Ltd. Ejecting device of a magnetic tape driving apparatus. 4,509,085, Cl. 360-93.000.
Sak, Dennis A.; Mestetsky, Thomas; and Manne, Stanley, to Arvey Corporation. Tamper-indicating self-sealing pouch. 4,509,196, Cl. 383-5.000.
Sakaeda, Keiko: *See*—
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Sakai Chemical Industry Co., Ltd: *See*—
Nakato, Hakaru; Sakuraya, Toshikazu; Habu, Yasuhiro; Emi, Toshihiko; Kodama, Masanori; Koshikawa, Takao; Yoshida, Yoshimitsu; and Shimokawa, Fumitaka, 4,508,571, Cl. 106-38.280.
Sakai, Ichio: *See*—
Numazawa, Akio; Sakai, Ichio; Kumagai, Tadanobu; and Nishikawa, Seiichi, 4,508,522, Cl. 464-11.000.
Sakai, Sai, to New Cosmos Electric Col, Ltd. Gas sensor. 4,509,034, Cl. 338-34.000.
Sakai, Tomio: *See*—
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Sakamoto, Hiroshi: *See*—
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, 4,508,680, Cl. 419-5.000.
Sakamoto, Masaharu: *See*—
Ohshima, Ken; and Sakamoto, Masaharu, 4,508,450, Cl. 356-237.000.
Sakamoto, Tomio: *See*—
Fujioka, Yoshiharu; Onuki, Akio; and Sakamoto, Tomio, 4,509,084, Cl. 360-84.000.
Sakanoue, Akira: *See*—
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Sakata, Gozyo; Numata, Tatsuo; Makino, Kenzi; Kakuta, Takuya; Kusano, Kazuya; Ikai, Takasi; and Oguti, Tosihiko, to Nissan Chemical Industries Ltd. 1-Phenylethyl sulfone derivatives of 2-pyridyl-N-oxides and herbicidal compositions containing same. 4,508,561, Cl. 71-94.000.
Sakata, Hideo; and Nakaoki, Tokuzo, to Mitutoyo Mfg. Co. Ltd. Radially adjustable internal grinder. 4,507,895, Cl. 51-98.00R.
Sakata, Yoshio; and Kakehashi, Yasushi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Magnetic roller device. 4,509,031, Cl. 335-306.000.
Sakuma, Kazuo: *See*—
Harata, Mituo; Hiraki, Hideaki; Uno, Shigeki; Sakuma, Kazuo; and Matsunaga, Kiyosi, 4,509,035, Cl. 338-35.000.
Sakurai, Kiyomi; and Arimatsu, Seiji, to Nippon Paint Co., Ltd. Waterless negative or positive lithographic printing plate preparation. 4,508,814, Cl. 430-303.000.
Sakurai, Toshio: *See*—
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Sakuraya, Toshikazu: *See*—
Nakato, Hakaru; Sakuraya, Toshikazu; Habu, Yasuhiro; Emi, Toshihiko; Kodama, Masanori; Koshikawa, Takao; Yoshida, Yoshimitsu; and Shimokawa, Fumitaka, 4,508,571, Cl. 106-38.280.

Sakuta, Masaharu; Kiya, Soichi; Uchizaki, Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, to Takenaka Komuten Co., Ltd.; Takenaka Doboku Co., Ltd.; and Sankyo Chemical Industries Ltd. Cement composition for laying underwater. 4,508,572, Cl. 106-90.000.

Salatiello, Peter P.; Petrucelli, Frank; and Flood, Paul W., to Allied Corporation. Nylon composition for use in rotational molding. 4,508,675, Cl. 264-310.000.

Salm, Dietmar F. E., to Broken Hill Proprietary Company Limited, The. Manufacture of tinplate and tinplate containers. 4,508,480, Cl. 413-1.000.

Salmon, Jean P., to Jeumont-Schneider. Apparatus for localizing of a train. 4,508,298, Cl. 246-167.00R.

Salvucci, Lucio P. Random number selection method and apparatus. 4,508,346, Cl. 273-144.00B.

Sameca S.A.: *See*—
Vandevoir, Claude A.; and Geiser, Markus, 4,507,992, Cl. 82-2.700.

Sampson, Darwin L.: *See*—
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Sampson, James D.: *See*—
Johnson, Nathan D.; Sampson, James D.; and Sampson, Darwin L., 4,508,238, Cl. 221-107.000.

Sandberg, Karen R.: *See*—
Jansma, Roger H.; and Sandberg, Karen R., 4,508,594, Cl. 162-135.000.

Sanders, David E.: *See*—
Andren, Carl F.; Mosley, William H., Jr.; and Sanders, David E., 4,509,017, Cl. 329-105.000.

Sangamo Weston, Inc.: *See*—
Coppola, Richard G.; and Stephens, George H., 4,509,128, Cl. 364-483.000.

Sankrithi, Mithra M. K. V. Truck afterbody drag reducing device. 4,508,380, Cl. 296-1.00S.

Sankyo Chemical Industries Ltd.: *See*—
Sakuta, Masaharu; Kiya, Soichi; Uchizaki, Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, 4,508,572, Cl. 106-90.000.

Sankyo Company Ltd.: *See*—
Konotsune, Takuo; and Kawakubo, Katsuhiko, 4,508,910, Cl. 548-367.000.

Sano, Shigehisa; Seto, Isao; Koseki, Hiroyuki; and Minomura, Mana, to Bridgestone Tire Company Limited. Pneumatic radial tires having an improved bead portion durability. 4,508,152, Cl. 152-356.00R.

Sanofi: *See*—
Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille G., 4,508,720, Cl. 514-247.000.

Sanraku-Ocean Co., Ltd.: *See*—
Kubo, Katsuro; Yoshioka, Takeo; Okabe, Mitsuyasu; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,508,648, Cl. 260-245.20T.

Santen, Sven; and Thornblom, Jan, to SKF Steel Engineering Aktiebolag. Method and plant for conversion of waste material to stable final products. 4,508,040, Cl. 110-347.000.

Santen, Sven: *See*—
Eriksson, Sune; Santen, Sven; and Bjorling, Gotthard, 4,508,566, Cl. 75-88.000.

Sanyo Electric Co., Ltd.: *See*—
Kumata, Masao; and Matsuoka, Noriaki, 4,508,793, Cl. 429-26.000.

Sarno, Felicisimo S.: *See*—
Corbett, Colin D.; Milloch, Robert L.; and Sarno, Felicisimo S., 4,508,741, Cl. 426-303.000.

Sartori, Guido: *See*—
Savage, David W.; and Sartori, Guido, 4,508,692, Cl. 423-228.000.

Sasagawa, Katsuyoshi; and Imai, Masao, to Mitsui Toatsu Chemicals, Inc. Metal complexes of halogen-substituted o-benzenedithiols. 4,508,655, Cl. 260-429.00R.

Sasaki, Masaki: *See*—
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, 4,508,680, Cl. 419-5.000.

Sasaki, Masaya: *See*—
Suzuki, Nobuhiko; Sutoh, Shinji; and Sasaki, Masaya, 4,507,932, Cl. 62-180.000.

Sasao, Isao, to Mitsubishi Denki Kabushiki Kaisha. Speed detecting device. 4,509,013, Cl. 324-161.000.

Sashiki, Takashi; and Sakaeda, Keiko, to Kabushiki Kaisha Ishida Koki Seisakusho. Weighing method and apparatus therefor. 4,508,186, Cl. 177-1.000.

Sato, Hideo: *See*—
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,508,805, Cl. 430-72.000.

Sato, Hisao: *See*—
Nagata, Wataru; Nishitani, Yasuhiro; and Sato, Hisao, 4,508,909, Cl. 548-251.000.

Sato, Kazusuke: *See*—
Kimura, Etsuji; Ogi, Katsumi; and Sato, Kazusuke, 4,508,322, Cl. 266-149.000.

Sato, Kyosaku, to Polysar Limited. Polymer compositions comprising polyamides, carboxylated (meth)acrylonitrile-butadiene rubber, and nonpolymeric additives. 4,508,867, Cl. 524-434.000.

Sato, Mineo; Kawaguchi, Tadaaki; Okawachi, Yukinori; and Funahashi, Yasuyuki, to Mitsubishi Denki Kabushiki Kaisha. Air conditioning apparatus of the type embedded within a ceiling. 4,507,940, Cl. 62-407.000.

Sato, Teiji: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,509,064, Cl. 346-207.000.

Satoh, Isao: *See*—
Ohara, Shunji; Yoshida, Tomio; Satoh, Isao; and Koishi, Kenji, 4,509,156, Cl. 369-54.000.

Satoh, Kozo: *See*—
Sugimoto, Hiroshi; and Satoh, Kozo, 4,509,011, Cl. 324-309.000.

Satoh, Osamu: *See*—
Mashimo, Tohru; and Satoh, Osamu, 4,508,035, Cl. 102-313.000.

Satou, Hiroshi: *See*—
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,508,682, Cl. 420-590.000.

Sauer, Donald J., to RCA Corporation. CCD charge substraction arrangement. 4,509,181, Cl. 377-63.000.

Saunders, Harold D. Cervical traction device. 4,508,109, Cl. 128-75.000.

Sautebin, Raoul, to Swiss Aluminium Ltd. Process for cooling in ingot during continuous casting. 4,508,160, Cl. 164-467.000.

Savage, David W.; and Sartori, Guido, to Exxon Research & Engineering Co. Process for the selective removal of hydrogen sulfide from gaseous mixtures with strongly basic tertiary amino compounds. 4,508,692, Cl. 423-228.000.

Savage, David W.: *See*—
Doyle, Gerald; Pruett, Roy L.; and Savage, David W., 4,508,694, Cl. 423-246.000.

Sawata, Tetsuya: *See*—
Tokuno, Masateru; and Sawata, Tetsuya, 4,508,279, Cl. 242-56.00R.

Sawata, Yukitaka: *See*—
Najima, Tetsuo; Tetsuta, Setsuya; Sawata, Yukitaka; and Yamagishi, Masahiro, 4,508,620, Cl. 209-500.000.

Sawusch, Axel. Device for filleting beheaded fish. 4,507,824, Cl. 17-61.000.

Sawyer, Carleton E.; and Masterman, Hugh C., to Display Components, Inc. Core element for electrodynamic rotary machine. 4,508,989, Cl. 310-184.000.

Sayles, David C., to United States of America, Army. Recovery of alcohol from a fermentation source by separation rather than distillation. 4,508,929, Cl. 568-923.000.

Scagliotti, Alfredo: *See*—
Invernizzi, Antonino, 4,509,092, Cl. 361-172.000.

Scartazzini, Riccardo: *See*—
Schaffner, Karl; and Scartazzini, Riccardo, 4,508,723, Cl. 514-195.000.

Schachter, Rozalie; Viscogliosi, Marcello; and Bunz, Lewis A., to Stauffer Chemical Company. Sputtered semiconducting films of catenated phosphorus material and devices formed therefrom. 4,509,066, Cl. 357-2.000.

Schachter, Rozalie: *See*—
Michel, Christian G.; Schachter, Rozalie; Kuck, Mark A.; Baumann, John A.; and Raccah, Paul M., 4,508,931, Cl. 136-255.000.

Schack, Carl J.; and Christe, Karl O., to United States of America, Air Force. Pentafluorotelluriumoxide fluorocarbons. 4,508,662, Cl. 260-550.000.

Schaefer, Donald D., to Dunham-Bush, Inc. Modular unload slide valve control assembly for a helical screw rotary compressor. 4,508,491, Cl. 417-310.000.

Schaetzle, Walter J.; Brett, C. Everett; and Al-Ansari, Jasem M. Method for and thermal energy injection withdrawal system for aquifers. 4,507,925, Cl. 60-641.400.

Schaffner, Karl; and Scartazzini, Riccardo, to Ciba Geigy Corporation. 6-Azaoligocycloalkylmethyleneaminopenam compounds. 4,508,723, Cl. 514-195.000.

Schaner, Ferdinand: *See*—
Weber, Klaus; Hujer, Friedrich; and Schaner, Ferdinand, 4,508,224, Cl. 206-455.000.

Scheiter, Bernd: *See*—
Bachmann, Erich; Fabel, Ludwig; Fischer, Roland; Peter, Werner; Scheiter, Bernd; and Wenzel, Werner, 4,508,494, Cl. 418-13.000.

Scheler, Philip E. Fireplace cap. 4,508,098, Cl. 126-139.000.

Schermann, Maurice, to Garages Mutualistes Francais. Method for measuring the state of damage of an automobile vehicle and measuring apparatus for carrying out said method. 4,507,872, Cl. 33-174.00R.

Schinzel, Erich: *See*—
Schonberger, Norbert; Schinzel, Erich; Martini, Thomas; and Rosch, Gunter, 4,508,900, Cl. 546-99.000.

Schlaikjer, Carl R.: *See*—
Gopikanth, Mysore L.; Kuo, Han C.; and Schlaikjer, Carl R., 4,508,800, Cl. 429-196.000.

Schlegel, Raymond F.; Bourassin, Rene P.; and Lapautre, Michel A., to Bertin & Cie. Energy recuperation centrifuge. 4,508,530, Cl. 494-49.000.

Schlesch, Ronald D.; and Lyons, Robert F., to Armstrong International, Inc. Combined inlet and outlet fitting. 4,508,135, Cl. 137-185.000.

Schlesinger, Lawrence; German, Dale F.; and Richards, Donald L., to Eaton Corporation. Circuit mounting apparatus. 4,507,956, Cl. 73-146.500.

Schleussner, Hans: *See*—
Sonneborn, Hans H.; Schwulera, Udo; and Schleussner, Hans, 4,508,833, Cl. 436-543.000.

Schlick, Horst; Hofert, Paul; and Caramel, Rudolf, to VDO Adolf Schindling AG. Electric clock movement, particularly a quartz clock movement. 4,508,458, Cl. 368-76.000.

Schliekelmann, Robert J., to Fokker BV. Method and apparatus for the non-destructive testing of materials by the use of ultra-sonic waves. 4,507,967, Cl. 73-621.000.

Schmidt, Adolf, to Bayer Aktiengesellschaft. Process for the production of fluid aqueous dispersions of polymers of conjugated dienes. 4,508,862, Cl. 524-157.000.

Schmidt, Hans-Georg, to Dynamit Nobel AG. 3H-Furanones. 4,508,914, Cl. 549-323.000.

Schmidt, Manfred; Bottenbruch, Ludwig; and Freitag, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of thermoplastic aromatic polyphosphonatocarbonates with improved heat-aging resistance, and their use. 4,508,890, Cl. 528-167.000.

Schneider, Bernhard: *See*—
Post, Lothar; and Schneider, Bernhard, 4,508,006, Cl. 89-24.000.

Schneider, Warren P.: *See*—
Patterson, Billy R.; and Schneider, Warren P., 4,508,375, Cl. 285-334.000.

Schnur, William H.: *See*—
Elepano, Normita P.; Schnur, William H.; and Jorgensen, Jens L., 4,508,634, Cl. 252-163.000.

Scholdstrom, Ragnar; Marcus, Holger; and Nordstrom, Lennart, to Geotronics AB. Apparatus for measuring the distance to a point on the inner wall of a hot furnace. 4,508,448, Cl. 356-5.000.

Scholz Research & Development: *See*—
Miller, Neil A., 4,509,191, Cl. 381-63.000.

Schonberger, Norbert; Schinzel, Erich; Martini, Thomas; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Cationic compounds of the naphthalimide series, process for their preparation and their use. 4,508,900, Cl. 546-99.000.

Schoofs, Inc.: *See*—
Schoofs, Richard J., 4,508,699, Cl. 423-574.00R.

Schoofs, Richard J., to Schoofs, Inc. Claus process improvement. 4,508,699, Cl. 423-574.00R.

Schott Glaswerke: *See*—
Beerwald, Hans; Boehm, Guenter; and Glomski, Guenter, 4,508,554, Cl. 65-3.100.
Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,508,834, Cl. 501-73.000.

Schourup, William E.: *See*—
Studer, Robert L.; and Schourup, William E., 4,508,130, Cl. 137-15.000.

Schroder, Karlheinz: *See*—
Ramesohl, Hubert; Seelen, Fritz; Filges, Ralf; Schroder, Karlheinz; and Veiser, Elmar, 4,508,503, Cl. 432-109.000.

Schroeder, Clifford A. Rigid duct with bendable elbow. 4,508,370, Cl. 285-53.000.

Schudel, Peter: *See*—
Crameri, Yvo; Ochsner, Paul A.; and Schudel, Peter, 4,508,925, Cl. 568-442.000.

Schuetz, James E.: *See*—
Keskey, William H.; Schuetz, James E.; and Lee, Do I., 4,508,869, Cl. 524-808.000.

Schulte, Jan J. Skid mounted multiple weaning calf enclosure. 4,508,060, Cl. 119-16.000.

Schulte, Richard: *See*—
Lorenz, Horst; and Schulte, Richard, 4,508,255, Cl. 228-5.100.

Schulte, Thomas: *See*—
Mansour, James D.; and Schulte, Thomas, 4,508,821, Cl. 435-34.000.

Schultz, Allan A. Waler bracket. 4,508,310, Cl. 249-189.000.

Schultz, George A. Tortilla press and oven unit. 4,508,025, Cl. 99-353.000.

Schultz, Roy D.: *See*—
Reiss, Leon G.; and Schultz, Roy D., 4,508,988, Cl. 310-154.000.

Schunk & Ebe GmbH: *See*—
Bodden, Werner; and Diegelmann, Winfried, 4,508,681, Cl. 419-29.000.

Schurter, Rolf: *See*—
Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, 4,508,560, Cl. 71-94.000.

Schwantje, Gerd: *See*—
Mueller, Josef; Wiersdorff, Walter-Wielant; Kirschenlohr, Werner; and Schwantje, Gerd, 4,508,924, Cl. 568-322.000.

Schwulera, Udo: *See*—
Sonneborn, Hans H.; Schwulera, Udo; and Schleussner, Hans, 4,508,833, Cl. 436-543.000.

SDS, Elektro GmbH: *See*—
Matsushita, Hidetoshi, 4,509,026, Cl. 335-85.000.

Sea World, Inc.: *See*—
Anderson, George B., 4,509,151, Cl. 367-118.000.

Seabrook, Robert A.: *See*—
Turner, Robert; and Seabrook, Robert A., 4,507,982, Cl. 74-493.000.

Seb S.A.: *See*—
Deville, Jean-Pierre, 4,508,100, Cl. 126-390.000.

Security Switch, Ltd.: *See*—
Pfeiffer, James W.; and Corder, Thomas E., 4,508,943, Cl. 200-17.00R.

Seelen, Fritz: *See*—
Ramesohl, Hubert; Seelen, Fritz; Filges, Ralf; Schroder, Karlheinz; and Veiser, Elmar, 4,508,503, Cl. 432-109.000.

Seeler, C. Oliver. Fluid pressure actuated immobilizing structure. 4,508,112, Cl. 128-89.00R.

Seely, James R., to Marketing Displays, Inc. Sign and attachment apparatus. 4,507,887, Cl. 40-606.000.

Seifert, Helmut; and Mondel, Karl, to Repa Feinstanzwerk GmbH. Deflection device for safety belts. 4,508,286, Cl. 242-107.000.

Seikosha Co., Ltd.: *See*—
Hashimoto, Masao; and Kato, Katsumi, 4,508,459, Cl. 368-276.000.

Seiner, Jerome A.: *See*—
Hodek, Robert B.; and Seiner, Jerome A., 4,508,646, Cl. 260-239.30R.

Seissl, Johann: *See*—
Krauss, Peter; Reinhardt, Jurgen; and Seissl, Johann, 4,509,074, Cl. 358-111.000.

Seitz, Helmut: *See*—
Dobler, Helmut; Zeller, Rolf; and Seitz, Helmut, 4,508,069, Cl. 123-192.00B.

Seki, Kenji: *See*—
Izumi, Kazuo; Shimazaki, Kenji; and Seki, Kenji, 4,508,851, Cl. 502-426.000.

Sekido, Yasuo: *See*—
Inoue, Akira; Takase, Shinji; Sekido, Yasuo; Mori, Masao; and Kubo, Tatsuki, 4,508,849, Cl. 502-263.000.

Sekigawa, Tatsuaki; Gotoh, Akio; Tsutsumi, Syuitsu; Marui, Kuniyoshi; and Honda, Naoto, to Toshiba Corporation. Wireless telephone apparatus with protection against power loss. 4,509,201, Cl. 455-73.000.

Sekiguchi, Nobuo: *See*—
Harada, Kazuhiro; Tsuchiya, Yuzoh; Sekiguchi, Nobuo; and Ishikawa, Toshio, 4,508,251, Cl. 226-25.000.

Sekiguchi, Yuji: *See*—
Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, 4,508,777, Cl. 428-280.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Iwai, Noboru; Hirunuma, Masanori; and Kaneko, Junichi, 4,508,669, Cl. 264-36.000.

Seko, Yasutoshi; Inoue, Masami; and Yanagishima, Takayuki, to Nissan Motor Company, Limited. Alarm system for preventing an automotive vehicle driver from dozing at the wheel. 4,509,040, Cl. 340-576.000.

Selenia Industrie Elettroniche Associate S.p.A.: *See*—
Marchetti, Renato; and Penco, Eugenio, 4,509,176, Cl. 372-86.000.

Selflevel Covers (Jersey) Limited: *See*—
Ferns, Derek, 4,508,470, Cl. 404-25.000.

Sellers, Elisabeth A.: *See*—
Sellers, Richard K.; and Sellers, Elisabeth A., 4,508,520, Cl. 446-485.000.

Sellers, Richard K.; and Sellers, Elisabeth A. Heart-shaped light-emitting novelty. 4,508,520, Cl. 446-485.000.

Semouha, Hertzl. Fastening mechanism. 4,507,878, Cl. 36-50.000.

Senda, Atsuo; Kasanami, Tohru; and Nakagawa, Takuji, to Murata Manufacturing Co., Ltd. Method for inhibiting oxidation of a copper film on ceramic body. 4,508,756, Cl. 427-81.000.

Sensor Systems, Inc.: *See*—
Robin, Seymour; and Klein, Yosef, 4,509,053, Cl. 343-708.000.

Sepheriades, Jean; and Lecharpy, Joel. Non-skid device for motor-vehicle tires. 4,508,151, Cl. 152-213.00A.

Seragnoli, Enzo, to G. D. Societa per Azione. Apparatus for feeding and wrapping products. 4,507,908, Cl. 53-498.000.

Servitova, Linda: *See*—
Simek, Petr; Barth, Tomislav; Brtnik, Frantisek; Jost, Karel; Machova, Alena; Servitova, Linda; and Slantinova, Jirina, 4,508,645, Cl. 260-112.50R.

Sethi, Amar J.: *See*—
Yong, Raymond N.; and Sethi, Amar J., 4,508,627, Cl. 210-728.000.

Seto, Isao: *See*—
Sano, Shigehisa; Seto, Isao; Koseki, Hiroyuki; and Minomura, Mana, 4,508,152, Cl. 152-356.00R.

Seufert, Josef J., to Metallgesellschaft Aktiengesellschaft. Electrostatic precipitator having a sealing cover or roof. 4,508,547, Cl. 55-101.000.

Sexton, Rodney N.: *See*—
Steele, Edward J.; and Sexton, Rodney N., 4,508,235, Cl. 215-307.000.

Seyfried, Christoph: *See*—
Hausberg, Hans-Heinrich; Prucher, Helmut; Uhl, Jurgen; Seyfried, Christoph; and Minck, Klaus, 4,508,732, Cl. 514-466.000.

Seytre, Gerard: *See*—
Camps, Marcel; Douillard, Alain; Dubois, Jean-Claude; Gazard, Maryse; Montheard, Jean-Pierre; Pascal, Thierry; and Seytre, Gerard, 4,508,639, Cl. 252-500.000.

Shaber, Gary S.; and Buenzli, Charles W., Jr., to Probex, Inc. Film strip for rapid test of a film processor. 4,508,686, Cl. 422-55.000.

Shalon, Tadmor: *See*—
Drews, Robert C.; Meyer, Danny D.; Shalon, Tadmor; and Pasternak, Eliezer, 4,508,532, Cl. 604-22.000.

Shamos, Morris: *See*—
Banko, William, 4,507,976, Cl. 73-861.540.

Shannon, Michael P.: *See*—
Coulter, James C.; and Shannon, Michael P., 4,508,046, Cl. 114-39.000.

Shanoski, Henry: *See*—
Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, 4,508,785, Cl. 428-424.400.

Shanton, Kenneth J., to Wiggins Teape Group Limited, The. Record material. 4,509,065, Cl. 346-225.000.

Sharp Kabushiki Kaisha: *See*—
Horigome, Koichi; Okada, Seizo; Nishimura, Katsuji; and Yamamoto, Hachizou, 4,509,136, Cl. 364-900.000.
Saiji, Mitsuhiro, 4,509,112, Cl. 364-200.000.
Takamatsu, Toshiaki; Funada, Fumiaki; Yasuda, Shuhei; and Matsuura, Masataka, 4,509,099, Cl. 361-413.000.
Tomino, Tadashi; and Higuchi, Masayuki, 4,508,402, Cl. 339-17.0CF.
Yamada, Shinji, 4,509,203, Cl. 455-166.000.
Yamasaki, Hitoshi, 4,508,962, Cl. 235-378.000.
Yatsunami, Kenrow; and Iwamoto, Yoshihiki, 4,509,129, Cl. 364-513.500.
Yoshida, Kunio, 4,509,137, Cl. 364-900.000.
Shaw, James E. Oil recovery method. 4,508,171, Cl. 166-273.000.
Shaw, Robert: *See*—
Graham, Marshall D.; Cook, Dudley D., Jr.; Gecks, Donald L.; and Shaw, Robert, 4,508,435, Cl. 350-529.000.
Shell Internationale Research Maatschappij B.V.: *See*—
Vorster, Heinz; Darton, Richard C.; Van Meurs, Hubrecht C. A.; and Krishna, Rajamani, 4,508,041, Cl. 110-347.000.
Shell Oil Co.: *See*—
Diaz, Zaida, 4,508,693, Cl. 423-236.000.
McCullough, J. Douglas, Jr., 4,508,872, Cl. 525-88.000.
Shemenski, Kenneth L. Process and pattern for decorating cylindrical articles. 4,508,763, Cl. 427-262.000.
Shenk, William H., to Honeywell Information Systems Inc. Method and apparatus for defining magnetic disk track field lengths using a programmable counter. 4,509,118, Cl. 364-200.000.
Shepard, Francis H., Jr. Apparatus for variable speed drive of an induction motor from a fixed frequency AC source. 4,509,004, Cl. 318-801.000.
Shepler, Eric F.; and Knapp, Anthony W., to Allied Corporation. Anti-decoupling mechanism for an electrical connector assembly. 4,508,408, Cl. 339-89.00M.
Shettler, Carol A. Alphabet blocks. 4,508,347, Cl. 273-157.00R.
Shevchenko, Viktor D.: *See*—
Maltsev, Jury S.; Shevchenko, Viktor D.; and Chernin, Mikhail M., 4,509,134, Cl. 364-813.000.
Shibuya, Koji: *See*—
Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,508,912, Cl. 549-253.000.
Shimadzu Corporation: *See*—
Okazaki, Nobuo, 4,508,449, Cl. 356-30.000.
Shimamura, Morihiko; and Uyama, Shintaro, to Jidosha Kiki Co., Ltd. Brake power servo booster. 4,508,009, Cl. 91-376.00R.
Shimazaki, Kenji: *See*—
Izumi, Kazuo; Shimazaki, Kenji; and Seki, Kenji, 4,508,851, Cl. 502-426.000.
Shimbara, Hiroyuki, to Nissan Motor Company, Limited. Fuel pump control apparatus. 4,508,077, Cl. 123-357.000.
Shimizu, Nobuyoshi; Fujimoto, Terunori; Inui, Tsuneo; and Ishida, Masatoki, to Toyo Kohan Co., Ltd. Tin free steel having an excellent weldability and its production method. 4,508,790, Cl. 428-632.000.
Shimizu, Shigehisa: *See*—
Kanaoka, Takeshi; and Shimizu, Shigehisa, 4,508,438, Cl. 354-105.000.
Shimokawa, Fumitaka: *See*—
Nakato, Hakaru; Sakuraya, Toshikazu; Habu, Yasuhiro; Emi, Toshihiko; Kodama, Masanori; Koshikawa, Takao; Yoshida, Yoshimitsu; and Shimokawa, Fumitaka, 4,508,571, Cl. 106-38.280.
Shimomura, Yasunori: *See*—
Kamada, Kazumasa; Tamai, Katsumi; Shimomura, Yasunori; and Abe, Kazunori, 4,509,163, Cl. 369-284.000.
Shimotake, Hiroshi: *See*—
Knoedler, Reinhard; Nelson, Paul A.; Shimotake, Hiroshi; and Battles, James E., 4,508,797, Cl. 429-184.000.
Shimoyama, Yoshifumi: *See*—
Sakuta, Masaharu; Kiya, Soichi; Uchizaki, Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, 4,508,572, Cl. 106-90.000.
Shinjo, Katsumi, to VE-Wissenschaftlich-Technischer Betrieb Keramik. Self-piercing nut holding device. 4,507,859, Cl. 29-798.000.
Shinohara, Toshio: *See*—
Hokamura, Sadakazu; Shinohara, Toshio; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,508,767, Cl. 427-407.100.
Shinozaki, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of making isolation grooves by over-filling with polycrystalline silicon having a difference in impurity concentration inside the grooves followed by etching off the overfill based upon this difference. 4,507,849, Cl. 29-576.00W.
Shionogi & Co., Ltd.: *See*—
Nagata, Wataru; Nishitani, Yasuhiro; and Sato, Hisao, 4,508,909, Cl. 548-251.000.
Shioya, Tsunetoshi: *See*—
Sakuta, Masaharu; Kiya, Soichi; Uchizaki, Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, 4,508,572, Cl. 106-90.000.
Shirai, Hitoshi: *See*—
Matsuzaki, Minoru; Hachimoto, Akihiko; Inoue, Takashi; Shirai, Hitoshi; Watanabe, Akira; and Tofukuji, Ikuo, 4,508,443, Cl. 354-402.000.
Shoff, Bernell D., to U.S. Truck Cranes, Inc. Remote control apparatus for a machine such as a crane. 4,508,014, Cl. 91-527.000.
Shook, Donald P.: *See*—
Silverman, Martin L.; and Shook, Donald P., 4,507,993, Cl. 82-36.00A.
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Berfield, Robert C.; Crevling, Robert L., Jr.; and Lawson, Lonnie B., Jr., 4,508,550, Cl. 55-216.000.
Short, Henry A., Sr. Lamp assembly. 4,509,105, Cl. 362-122.000.
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Kanda, Masahiro; Hatakeyama, Tetsuya; and Morito, Yusuke, 4,508,640, Cl. 252-503.000.
Showa Electric Wire & Cable Co.: *See*—
Harada, Kazuhiro; Tsuchiya, Yuzoh; Sekiguchi, Nobuo; and Ishikawa, Toshio, 4,508,251, Cl. 226-25.000.
Sich, Janice M.: *See*—
Noren, Gerry K.; Poklacki, Erwin S.; Hawker, Fred D.; and Sich, Janice M., 4,508,889, Cl. 528-28.000.
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Ruoss, Erwin; and Sieber, Kurt, 4,508,551, Cl. 55-263.000.
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Donner, Bernd; and Siefert, Roland, 4,507,963, Cl. 73-431.000.
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Wyatt, Philip W.; Newsome, Allen L., Jr.; Bloom, William G.; Siegel, Bernard; and Lubov, Michael, 4,508,123, Cl. 128-692.000.
Siegert, Gunter; and Rasch, Ulf, to SUDHAUS Schloss- und Beschlagtechnik GmbH & Co. Full-strap assembly for towing a wheeled suitcase. 4,508,202, Cl. 190-115.000.
Sieja, James B., to Du Pont de Nemours, E. I., and Company. Carbonylation of olefinically unsaturated nitriles and acids using a sulfone solvent. 4,508,660, Cl. 260-465.400.
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Behn, Reinhard; Heywang, Hermann; and Pachonik, Horst, 4,508,049, Cl. 118-50.100.
Freller, Helmut; Horauf, Friedrich; Lorenz, Hans-Peter; and Mund, Konrad, 4,508,430, Cl. 350-351.000.
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Heimlicher, Peter, 4,509,023, Cl. 331-176.000.
Kimpel, Rolf-Dieter; Rauterberg, Ulf; and Tamm, Horst, 4,509,025, Cl. 335-85.000.
Krauss, Peter; Reinhardt, Jurgen; and Seissl, Johann, 4,509,074, Cl. 358-111.000.
Muller, Erwin, 4,509,028, Cl. 335-202.000.
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Zuckler, Karl, 4,508,945, Cl. 200-144.00B.
Siewell, Gary: *See*—
Low, Robert N.; Cloutier, Frank L.; and Siewell, Gary, 4,509,062, Cl. 346-140.00R.
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Leistner, Herbert E., 4,508,478, Cl. 411-176.000.
Sigmatron Associates: *See*—
Essinger, Walter F., 4,508,990, Cl. 313-50.000.
Sigmon, Ned A.: *See*—
Hughes, Richard L.; and Sigmon, Ned A., 4,508,411, Cl. 339-99.00R.
Sigmund, Adolf, to Sigri Elektrographit GmbH. Production line for graphite nipples. 4,507,860, Cl. 29-825.000.
Signetics Corporation: *See*—
Puar, Deepraj S., 4,508,980, Cl. 307-530.000.
Sigri Elektrographit GmbH: *See*—
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Kelley, Robert C.; and Silberman, Ira J., 4,508,335, Cl. 272-145.000.
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Simmen, Christian, to Heberlein Maschinenfabrik AG. Jet texturing nozzle. 4,507,833, Cl. 28-254.000.
Simms, R. John; and Haney, Jerry D., to Oxbridge, Inc. Automatic optical inspection apparatus. 4,509,075, Cl. 358-106.000.
Simon, Frederick A.: *See*—
Hayosh, Robert J.; Lewis, Robert H.; and Simon, Frederick A., 4,508,280, Cl. 242-191.000.
Simon, Jaime; Wilson, David A.; and Volkert, Wynn A., to Dow Chemical Company, The. Radioactive metals complexed with phosphonate derivatives of bicycloheptane bis(alkylamines). 4,508,704, Cl. 424-14.000.
Simon, Joachim W., to Nixdorf Computer AG. PCM Communication system and method of operation. 4,509,166, Cl. 370-62.000.
Simpson, Buddy B. Sound level indicating devices. 4,509,189, Cl. 381-56.000.
Simpson, Floyd H. Two-piece ear tag removing tool. 4,507,839, Cl. 29-268.000.
Simpson, Jay P.: *See*—
Walker, Thad O.; Simpson, Jay P.; and Dearing, Harry L., 4,508,628, Cl. 252-8.50P.

Sing Chuen, Johnny Y.: *See*—
D'Andrade, Bruce M.; and Sing Chuen, Johnny Y., 4,508,516, Cl. 446-443.000.
Singer, Klaus-Peter; and Butenop, Klaus, to Autoflug GmbH. Roll-up device for safety belts. 4,508,289, Cl. 242-107.40B.
Singer, Martin H.: *See*—
Burger, William A.; Embree, David M.; Singer, Martin H.; and Vogelpohl, David R., 4,508,937, Cl. 179-84.00T.
Sipple, Kenneth J.: *See*—
Stratton, Leo M.; Sipple, Kenneth J.; and Tatonetti, Mario B., 4,507,965, Cl. 73-517.00B.
Sircar, Ila; Cain, Michael H.; and Topliss, John G., to Warner-Lambert Company. Cardiotonic and antihypertensive oxadiazinone compounds. 4,508,718, Cl. 514-238.000.
Sirinyan, Kirkor; and Merten, Rudolf, to Bayer Aktiengesellschaft. Metallized polymer granules, and their use. 4,508,780, Cl. 428-407.000.
Sisti, Giorgio; and Verga, Giuseppe, to Carlo Erba Strumentazione S.p.A. Modified-flame thermionic detector for gas chromatographs and method for the identification of components in sample under analysis. 4,508,685, Cl. 422-54.000.
Sitterle, George, to Frontier Contact Lenses of Florida, Inc. Soft toric contact lens. 4,508,436, Cl. 351-160.00H.
Sixt, Karl: *See*—
Woltmann, Reinhard; and Sixt, Karl, 4,508,159, Cl. 164-306.000.
Sjostrand, Sven E.: *See*—
Junggren, Ulf K.; and Sjostrand, Sven E., 4,508,905, Cl. 546-271.000.
SKF Steel Engineering Aktiebolag: *See*—
Eriksson, Sune; Sarten, Sven; and Bjorling, Gotthard, 4,508,566, Cl. 75-88.000.
Santen, Sven; and Thornblom, Jan, 4,508,040, Cl. 110-347.000.
Skinner, Neal G.; and Wesson, David S., to Halliburton Company. Downhole tool and method of using the same. 4,508,174, Cl. 166-373.000.
Skolnick, Joel B. Book with puppet. 4,508,515, Cl. 446-148.000.
SKW Trostberg Aktiengesellschaft: *See*—
von Seyerl, Joachim, 4,508,638, Cl. 252-401.000.
Slantinova, Jirina: *See*—
Simek, Petr; Barth, Tomislav; Brtnik, Frantisek; Jost, Karel; Machova, Alena; Servitova, Linda; and Slantinova, Jirina, 4,508,645, Cl. 260-112.50R.
Slattery, Walter T. Compact versatile portable cooker. 4,508,096, Cl. 126-9.00R.
Smakula, Peter H. Truss rod apparatus. 4,508,003, Cl. 84-293.000.
Small, Irvin L., to Horace Small Manufacturing Company. Adaptive ballistic panel carrying garment. 4,507,802, Cl. 2-2.500.
Smiley, Harry; and Blechman, Abraham, to Medical Magnetics, Inc. Magnetic orthodontic torquing appliance. 4,508,505, Cl. 433-18.000.
Smith, Christopher G.; and Peters, John F., to PQ Corporation. Composites utilizing fillers of surface modified hollow microspheres. 4,508,856, Cl. 523-218.000.
Smith, Gray H., Jr. Waterbed with sound wave system. 4,507,816, Cl. 5-451.000.
Smith, Lee M.: *See*—
Andrade, Joseph D.; Triolo, Philip M.; Smith, Lee M.; and Miller, Frank J., 4,508,606, Cl. 204-169.000.
Smith, Peter R., to Fairchild Camera & Instrument Corporation. Control of substrate injection in lateral bipolar transistors. 4,507,848, Cl. 29-576.00B.
Smith, Roderick L., to Energy Adaptive Grinding, Inc. Centerless grinding systems. 4,507,896, Cl. 51-165.920.
Smith, Ronald W. Cabinet. 4,507,893, Cl. 47-74.000.
Smith, Russell G. Fail safe actuator. 4,507,919, Cl. 60-404.000.
Smith, Theodore D. Metallised fabric. 4,508,776, Cl. 428-248.000.
Smiths Industries Public Limited Company: *See*—
Baldwin, Graham J.; and McCann, Michael O., 4,509,096, Cl. 361-386.000.
Brazener, David J., 4,507,959, Cl. 73-182.000.
Smyth, Patrick G.: *See*—
Doll, Brian E.; and Smyth, Patrick G., 4,508,683, Cl. 422-7.000.
Snap-on Tools Corporation: *See*—
Herman, Timm R.; and Mikic, Frank, 4,508,005, Cl. 81-177.00G.
So, Yuzo: *See*—
Suzuki, Koichi; Oose, Seiroku; So, Yuzo; and Hirao, Yasutaka, 4,509,104, Cl. 362-32.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Green, David; and Blanc, Maurice, 4,508,743, Cl. 426-422.000.
Societe Nationale Elf Aquitaine: *See*—
Lazarre, Flavien, 4,508,354, Cl. 277-27.000.
Societe Nationale Industrielle Aerospatiale: *See*—
Rousseau, Gerard, 4,508,762, Cl. 427-228.000.
Socimi, S.p.A.: *See*—
Cigognini, Silvio, 4,508,200, Cl. 188-264.00P.
Soderberg, John H.; and Duwel, Edward C., to Pitney Bowes Inc. Postage meter with keyboard keys used for changing operating constants. 4,509,141, Cl. 364-900.000.
Sogo, Hiroyuki; Ohsawa, Zenichi; Umino, Isamu; and Nishida, Haruki, to Fujitsu Limited. Frequency conversion unit. 4,509,208, Cl. 455-317.000.
Sohl, Gordon; Ort, Donald L.; and Leicht, John R., to Xerox Corporation. Automatic calibration of drop-on-demand ink jet ejector. 4,509,057, Cl. 346-1.100.
Somezawa, Masashi: *See*—
Takei, Yutaka; and Somezawa, Masashi, 4,508,752, Cl. 427-48.000.
Somfai, Eva: *See*—
Huhn, Magda; Szabo, Gabor; Dvortsak, Peter; Karpati, Marianna; and Somfai, Eva, 4,508,658, Cl. 260-465.00D.
Sommer, Alan C.: *See*—
Kaya, Azmi; and Sommer, Alan C., 4,507,930, Cl. 62-129.000.
Sone, Kohki: *See*—
Okamura, Kenji; Nagaishi, Hatsuo; Kitahara, Tsuyoshi; Sone, Kohki; and Nakamura, Koyo, 4,507,986, Cl. 74-866.000.
Sonneborn, Hans H.; Schwulera, Udo; and Schleussner, Hans, to Biotest-Serum-Institut GmbH. Separation of interleukin-2 from phytohemagglutinin by dye matrix chromatography. 4,508,833, Cl. 436-543.000.
Sony Corporation: *See*—
Fujimura, Yasushi; Okada, Takashi; Tanaka, Yutaka; and Ikeda, Yasunari, 4,509,071, Cl. 358-11.000.
Hayashi, Yoshio; Aoyagi, Kouji; Sakurai, Toshio; Kashima, Tusnehiro; and Higeta, Koichi, 4,509,138, Cl. 364-900.000.
Nakano, Kenji, 4,509,083, Cl. 360-77.000.
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Yamamoto, Kaichi, 4,509,016, Cl. 328-138.000.
Soos, Rudolf: *See*—
Fogassy, Elemer; Toke, Laszlo ; Faigl, Ferenc; Soos, Rudolf; Bozzay, Jozsef; Kolta, Rezso; Nemes, Jozsef; and Bencsik, Peter, 4,508,919, Cl. 562-401.000.
Sorensen, Jens O. Core stabilization by sequential injections. 4,508,676, Cl. 264-328.800.
Soth, Henry J.: *See*—
Kukowski, John A.; Soth, Henry J.; and Gay, William H., 4,507,862, Cl. 29-837.000.
Soxil S.p.A.: *See*—
Rodari, Gianpiero S., 4,508,117, Cl. 128-204.210.
Spanier, Barry, to Maui Harness Corporation. Sailboard harness. 4,508,045, Cl. 114-39.000.
Spector, Abner. Effects box system and method. 4,509,190, Cl. 381-61.000.
Speit, Burkhard: *See*—
Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,508,834, Cl. 501-73.000.
Spektor, Jury N.; Gaponov, Valery M.; and Masovich, Felix Z., to Gosudarstvenny Proektno-Konstruktorsky I Experimentalny Institut Ugolnogo Mashinostroenia. Mining machine for extraction of minerals. 4,508,391, Cl. 299-43.000.
Spengler, Ernst M., to Stanztechnik GmbH R & S. System for manufacturing three-dimensional work pieces. 4,508,499, Cl. 425-88.000.
Sperry Corporation: *See*—
Campbell, Willis R.; Hunt, Larry J.; and Waldrop, T. William, 4,508,359, Cl. 280-463.000.
Chen, Tsu F.; and Phillips, Edwin R., 4,507,834, Cl. 29-26.00R.
Gershenson, Meir, 4,509,018, Cl. 330-61.00R.
Lustig, Claude D., 4,509,045, Cl. 340-794.000.
Wang, Tsing-Chow; and Josephs, Richard M., 4,509,146, Cl. 365-162.000.
Spinks, Anne E.: *See*—
Whyzmuzis, Paul D.; and Spinks, Anne E., 4,508,868, Cl. 524-607.000.
Spinnett, Raymond G., to KDI American Products, Inc. Retrofit pulsator apparatus and method for an air/water mixer of a swimming pool, therapy tub, spa or the like. 4,508,665, Cl. 261-93.000.
Spivack, John D.; and Pastor, Stephen D., to Ciba-Geigy Corporation. S-(4-Hydroxyphenyl)thiocarboxylic ester antioxidants. 4,508,865, Cl. 524-283.000.
Sprague Electric Company: *See*—
Bernard, Walter J.; and Millard, Richard J., 4,508,563, Cl. 75-0.5BB.
Finkelstein, Manuel; and Ross, Sidney D., 4,509,094, Cl. 361-314.000.
Puppolo, Henry F., 4,509,100, Cl. 361-433.000.
Sprenkle, George J., to Burroughs Corporation. Insertion device for an electronic circuit package assembly. 4,507,861, Cl. 29-741.000.
Square D Company: *See*—
Profio, Mark V., 4,509,088, Cl. 361-29.000.
Staats, Gotthard: *See*—
Eschmann, Friedrich; Gelsdorf, Gunter; Nold, Peter; Staats, Gotthard; and Subat, Gerhard, 4,508,504, Cl. 432-217.000.
Staehli, Urs, to Rieter Machine Works Ltd. Cleaning machine for fiber material. 4,507,827, Cl. 19-200.000.
Staffeld, Stanley E. Connector and insertion tool. 4,507,817, Cl. 7-158.000.
Stahl, Edward L.: *See*—
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Stahl, Gunther: *See*—
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Stahl, Howard D.: *See*—
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Stahl, Steven B.; Bakhshi, Shiv K.; and Naul, George M., to Owens-Corning Fiberglas Corporation. Molding of glass wool with wrinkle-free surface. 4,508,673, Cl. 264-120.000.
Stahl, William L., Jr.: *See*—
Leininger, Joel C.; Moore, Victor S.; and Stahl, William L., Jr., 4,509,114, Cl. 364-200.000.
Stahlecker, Peter H.: *See*—
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Stahlmann, Rudolf: *See—*
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Standard Oil Company, The: *See—*
Dolhyj, Serge R.; and Enyedy, Roseann M., 4,508,848, Cl. 502-239.000.
Giffen, William M., Jr.; Li, George S.; and Miller, Arthur F., 4,508,787, Cl. 428-473.500.

Standard Oil Company (Indiana): *See—*
Nimry, Tayseer S.; and Fields, Ellis K., 4,508,605, Cl. 204-158.00R.
Reed, Robert L., 4,508,698, Cl. 423-574.00R.

Stanley, Louis, to Card-O-Matic Pty. Limited. Punch and winding machine. 4,507,947, Cl. 72-130.000.

Stanztechnik GmbH R & S: *See—*
Spengler, Ernst M., 4,508,499, Cl. 425-88.00G.

Star-Kist Foods, Inc.: *See—*
Corbett, Colin D.; Milloch, Robert L.; and Sarno, Felicisimo S., 4,508,741, Cl. 426-303.000.

State of Israel, Ministry of Agriculture: *See—*
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Stauffer Chemical Company: *See—*
Michel, Christian G.; Schachter, Rozalie; Kuck, Mark A.; Baumann, John A.; and Raccah, Paul M., 4,508,931, Cl. 136-255.000.
Schachter, Rozalie; Viscogliosi, Marcello; and Bunz, Lewis A., 4,509,066, Cl. 357-2.000.

Stauffer, Harold F., Jr.: *See—*
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Ste LOOK: *See—*
Beyl, Jean; Bernard, Jean; Guerreau, Rene ; le Faou, Daniel; and Peyre, Henri, 4,508,360, Cl. 280-605.000.

Stebles, Malcolm R.: *See—*
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Steeger, Gerhard, to Siemens Aktiengesellschaft. Device for the compensation of hearing impairments. 4,508,940, Cl. 179-107.0FD.

Steel Heddle Mfg. Co.: *See—*
Bowen, James B.; and Kramer, Charles F., 4,508,145, Cl. 139-92.000.

Steele, Edward J.; and Sexton, Rodney N., to Runglin Co. Inc. Beverage cup cover. 4,508,235, Cl. 215-307.000.

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Steiner, Erwin; and Stahlecker, Peter H., to Technology Consulting Corporation. Method and apparatus for the continuous treatment of yarn. 4,507,832, Cl. 28-248.000.

Steiner, Jean-Pierre: *See—*
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Steinert, Leopold A.; and Perry, Richard W., to General Electric Company. Method for compacting nuclear reactor components. 4,507,840, Cl. 29-401.100.

Steinmann, Helmut, to Robert Bosch GmbH. Ventilating arrangement. 4,508,021, Cl. 98-2.010.

Stellberger, Karl-Heinz, to Hulsbeck & Furst GmbH & Co. KG. Electronic locking device having key and lock parts interacting via electrical pulses. 4,509,093, Cl. 361-172.000.

Stepan, Walter, to Uvex Winter Optik GmbH. Visor for a protective helmet. 4,507,809, Cl. 2-424.000.

Stepan, William E.; Neese, Wayne E.; Belanger, Thomas D., Jr.; and Janninck, Robert F., to GTE Automatic Electric Inc. Printed circuit connecting device. 4,508,398, Cl. 339-17.0LM.

Stepan, William E., to GTE Automatic Electric Inc. Method of producing fine line conductive/resistive patterns on an insulating coating. 4,508,753, Cl. 427-53.100.

Stepan, William E., to GTE Automatic Electric Inc. Method of adding fine line conductive/resistive patterns to a thick film microcircuit. 4,508,754, Cl. 427-53.100.

Stephan, Karl D.: *See—*
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Stephens, George H.: *See—*
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Stern, Howard K.: *See—*
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Steuler-Industriewerke GmbH: *See—*
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Stevens, Udo: *See—*
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Stevenson, Philip E.: *See—*
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Stewart Systems, Inc.: *See—*
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Stewart-Warner Corporation: *See—*
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Stockdale, Trevor J., to U.S. Philips Corporation. Atomic absorption spectrophotometer. 4,508,451, Cl. 356-315.000.

Stoisiek, Michael, to Siemens Aktiengesellschaft. Thyristor with controllable emitter short circuits and trigger amplification. 4,509,068, Cl. 357-38.000.

Stoisiek, Michael, to Siemens Aktiengesellschaft. Light triggerable thyristor with controllable emitter-short circuit and trigger amplification. 4,509,069, Cl. 357-38.000.

Stolz, Richard J.: *See—*
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Stoner, David A.: *See—*
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Stopp, Gerhard; Karkossa, Horst; and Trescher, Viktor, to Bayer Aktiengesellschaft. Process for the preparation of aromatic hydroxycarboxylic acids. 4,508,920, Cl. 562-423.000.

Stouffer, Ronald D., to Bowles Fluidics Corporation. Liquid oscillator device. 4,508,267, Cl. 239-11.000.

Stover, William A.: *See—*
Cormier, William E., Jr.; Pasquale, Gary M.; and Stover, William A., 4,508,840, Cl. 502-70.000.

Stradella, Fabio. Level gauge for liquefied gas tanks, with dial-and-hand indicator actuated by an axially movable drive coupled with a single internal magnet. 4,507,961, Cl. 73-317.000.

Stratton, Leo M.; Sipple, Kenneth J.; and Tatonetti, Mario B., to Columbia Research Laboratories. Detector for determining both forces on and positions of a host device. 4,507,965, Cl. 73-517.00B.

Straughn, Roy D. Speaker enclosure. 4,509,192, Cl. 381-90.000.

Strauss, Georg: *See—*
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Streeter, Bert E.; Streeter, Mary M.; and Robinson, Larry G. Display sign. 4,507,886, Cl. 40-447.000.

Streeter, Mary M.: *See—*
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Stuempel, Hans-Jurgen; Diehl, Manfred; and Bergmann, Roland, to Degussa Aktiengesellschaft. Scouring powder. 4,508,633, Cl. 252-135.000.

Strobert, Samuel S.: *See—*
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Strom Corporation: *See—*
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Strom, Larry O.; and Guex, Betty S., to Strom Corporation. Pneumatic percussor. 4,508,107, Cl. 128-54.000.

Stroud, Lebern W. Dual alternator system. 4,509,005, Cl. 320-68.000.

Stroz, John J.; and Mackay, Donald A. M., to Nabisco Brands, Inc. Method of reducing dental caries. 4,508,713, Cl. 514-60.000.

Struzik, Lawrence F.: *See—*
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Stude, Michael E. Marker attachment for rules. 4,507,869, Cl. 33-42.000.

Studer, Robert L.; and Schourup, William E. Method and apparatus for repairing water leaks. 4,508,130, Cl. 137-15.000.

Sturgess, Michael G.: *See—*
Ring, John; French, David; Hickling, Michael; and Sturgess, Michael G., 4,508,765, Cl. 427-386.000.

Su, Hsueh-Ling: *See—*
Chang, Ching-Te; Lee, Lian-Tze; and Su, Hsueh-Ling, 4,508,654, Cl. 260-429.00R.

Subat, Gerhard: *See—*
Eschmann, Friedrich; Gelsdorf, Gunter; Nold, Peter; Staats, Gotthard; and Subat, Gerhard, 4,508,504, Cl. 432-217.000.

Suchdev, Jagan N., to General Motors Corporation. Piston cooling oil delivery tube assembly. 4,508,065, Cl. 123-41.350.

Sud Chemie Aktiengesellschaft: *See—*
Buckl, Hans, 4,508,838, Cl. 502-62.000.

Sudbeck, Rainer: *See—*
Baumgartner, Hans; and Sudbeck, Rainer, 4,508,089, Cl. 123-559.000.

SUDHAUS Schloss- und Beschlagtechnik GmbH & Co.: *See—*
Siegert, Gunter; and Rasch, Ulf, 4,508,202, Cl. 190-115.000.

Suga, Masaaki: *See—*
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, 4,509,124, Cl. 364-424.100.

Sugimori, Masahiro: *See—*
Kishida, Kazuo; Hasegawa, Akira; and Sugimori, Masahiro, 4,508,875, Cl. 525-308.000.

Sugimoto, Hiroshi; and Satoh, Kozo, to Tokyo Shubaura Denki Kabushiki Kaisha. Nuclear magnetic resonance diagnostic apparatus. 4,509,011, Cl. 324-309.000.

Sugitani, Hiroshi; Inamoto, Tadayoshi; and Yokota, Masami, to Canon Kabushiki Kaisha. Ink jet recording head with delaminating feature. 4,509,063, Cl. 346-140.00R.

Sulitzeanu, Bernard, to Teva Pharmaceutical Industries Ltd. Method and kit for pregnancy detection. 4,508,829, Cl. 436-510.000.

Sullivan, Paul A., to NCR Corporation. Method of making CMOS by twin-tub process integrated with a vertical bipolar transistor. 4,507,847, Cl. 29-576.00B.

Sulzer Brothers Limited: *See—*
Hintsch, Otto, 4,508,146, Cl. 139-[illegible]6.200.
Obrist, Albert; and Gadgill, Balkrishna B., 4,508,690, Cl. 423-173.000.

Sumitomo Chemical Company, Limited: *See—*
Nakayama, Koji; Yoshida, Ryo; and Matsumoto, Hiroshi, 4,508,562, Cl. 71-94.000.

Sumitomo Electric Industries, Ltd.: *See—*
Miyake, Masayoshi; Ueoka, Isao; Kawaguchi, Munetaka; Nakabayashi, Hirohiko; and Yamamoto, Teruyuki, 4,508,779, Cl. 428-383.000.

Nishiwaki, Yoshikazu, 4,508,420, Cl. 350-3.600.
Sun Chemical Corporation: *See*—
Chamberlain, Terence R., 4,508,899, Cl. 544-225.000.
Suncor, Inc.: *See*—
Yong, Raymond N.; and Sethi, Amar J., 4,508,627, Cl. 210-728.000.
Sung, Rodney L.: *See*—
Kaufman, Benjamin J.; and Sung, Rodney L., 4,508,541, Cl. 44-71.000.
Superfos Emballage A/S: *See*—
Jorgensen, Helge D., 4,507,821, Cl. 16-126.000.
Suroff, Leonard W.: *See*—
Kolt, Stanley, 4,507,922, Cl. 60-531.000.
Sutoh, Shinji: *See*—
Suzuki, Nobuhiko; Sutoh, Shinji; and Sasaki, Masaya, 4,507,932, Cl. 62-180.000.
Suzuki, Akio: *See*—
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, 4,508,680, Cl. 419-5.000.
Suzuki, Fuminori, to Citizen Watch Co., Ltd. Frequency-selectable signal generator. 4,508,000, Cl. 84-1.010.
Suzuki, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument using large-capacity recording medium. 4,508,001, Cl. 84-1.010.
Suzuki, Koichi; Oose, Seiroku; So, Yuzo; and Hirao, Yasutaka, to Dainichi-Nippon Cables, Ltd. High temperature resistant lighting device. 4,509,104, Cl. 362-32.000.
Suzuki, Makoto: *See*—
Onuma, Kazuhiko; Kageyama, Yoichi; Kobayashi, Hiromu; Matsuki, Akihiro; and Suzuki, Makoto, 4,508,841, Cl. 502-73.000.
Suzuki, Masahiko: *See*—
Mizuno, Shigeru; Suzuki, Masahiko; Mizuno, Haruki; and Katsu, Masutaro, 4,508,567, Cl. 75-231.000.
Suzuki, Masayuki: *See*—
Ohara, Tsunemasa; Suzuki, Masayuki; and Yamamichi, Masayoshi, 4,508,439, Cl. 354-154.000.
Suzuki, Nobuhiko; Sutoh, Shinji; and Sasaki, Masaya, to Diesel Kiki Co., Ltd. Control system for air conditioning systems. 4,507,932, Cl. 62-180.000.
Suzuki, Seigo, to Tokyo Shibaura Denki Kabushiki Kaisha. Signal synthesizer apparatus. 4,509,188, Cl. 381-53.000.
Suzuki, Tadashi; Morimoto, Yoshiro; Hamada, Hideo; Suga, Masaaki; and Murasugi, Takashi, to Nissan Motor Company, Limited. Lock-up control system for lock-up type automatic transmission. 4,509,124, Cl. 364-424.100.
Suzuki, Tetsuo, to Tokyu Musashi Mfg. Co., Ltd. Algal culturing reef unit, artificial reef unit and artificial culturing and fishing field unit. 4,508,057, Cl. 119-3.000.
Svedberg, Per, to ASEA Aktiebolag. Two-pole overcurrent protection device. 4,509,089, Cl. 361-100.000.
Svoboda, Josef; Nitschko, Theodor; and Wittmann, Heinz, to TMC Corporation. Safety ski binding. 4,508,361, Cl. 280-628.000.
Swafford, Charles V.: *See*—
Becker, Billy G.; and Swafford, Charles V., 4,508,166, Cl. 166-117.500.
Swarthout, Richard L., to United States of America, Army. Ammunition locking mechanism. 4,508,215, Cl. 206-3.000.
Swearingin, David. Nipple feeder for dispensing dry feed. 4,508,061, Cl. 119-51.00R.
Swiss Aluminium Ltd.: *See*—
Sautebin, Raoul, 4,508,160, Cl. 164-467.000.
System Homes Company Ltd.: *See*—
Yoshino, Hozo, 4,507,936, Cl. 62-235.100.
Syva Company: *See*—
Yoshida, Robert A., 4,508,892, Cl. 536-51.000.
Szabo, Gabor: *See*—
Huhn, Magda; Szabo, Gabor; Dvortsak, Peter; Karpati, Marianna; and Somfai, Eva, 4,508,658, Cl. 260-465.00D.
Szcupak, Peter, to Chicago Rawhide Manufacturing Company. Multifunction fluid seal for dampers and the like. 4,508,020, Cl. 92-168.000.
Szczepanski, Henry: *See*—
Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, 4,508,560, Cl. 71-94.000.
Szporny, Laszlo : *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,508,926, Cl. 568-766.000.
Tachikawa, Kyoji: *See*—
Wada, Hitoshi; Tachikawa, Kyoji; Yamada, Yutaka; and Murase, Satoru, 4,508,578, Cl. 148-11.50F.
Taft, Phillip A.: *See*—
Reynolds, Desmond H. J.; and Taft, Phillip A., 4,508,012, Cl. 91-512.000.
Taira, Kazuo: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,508,481, Cl. 413-1.000.
Taizo Ayukawa: *See*—
Ayukawa, Taizo, 4,508,707, Cl. 424-70.000.
Tajima, Shinobu; Umeda, Yasukazu; and Kamohara, Toshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Computer control system for selecting a desired control program from a plurality of control programs. 4,509,143, Cl. 364-900.000.
Takahashi, Kimio: *See*—
Hirose, Etsuro; Takahashi, Kimio; Mori, Toshiro; and Kaito, Haruyuki, 4,507,942, Cl. 68-20.000.
Takahashi, Seikichi: *See*—
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,509,064, Cl. 346-207.000.
Takaki, Akira; and Hosoi, Hideki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Graft copolymer useful as reinforcements for vinyl chloride polymers and process for preparing the same. 4,508,876, Cl. 525-310.000.
Takamatsu, Toshiaki; Funada, Fumiaki; Yasuda, Shuhei; and Matsuura, Masataka, to Sharp Kabushiki Kaisha. Electronic component with plurality of terminals thereon. 4,509,099, Cl. 361-413.000.
Takami, Toshihiro; and Isobe, Masahiro, to Toyota Jidosha Kabushiki Kaisha. Sealing device for timing belt cover and engine mount bracket. 4,508,072, Cl. 123-195.00C.
Takanashi, Masami: *See*—
Yashima, Michio; Komatsu, Akihiro; Takanashi, Masami; Hirose, Masashi; and Nakayama, Kengo, 4,508,944, Cl. 200-61.850.
Takano, Yoshiya, to Hitachi, Ltd. Fuel injection pump. 4,508,081, Cl. 123-450.000.
Takao, Mitsunori; and Mizuno, Toshiaki, to Nippondenso Co., Ltd. Method and apparatus for controlling internal combustion engines. 4,508,075, Cl. 123-339.000.
Takasaki, Kunihiko, to Takigen Zeizous Co., Ltd. Door handle unit. 4,508,377, Cl. 292-166.000.
Takase, Shinji: *See*—
Inoue, Akira; Takase, Shinji; Sekido, Yasuo; Mori, Masao; and Kubo, Tatsuki, 4,508,849, Cl. 502-263.000.
Takeda, Hideo: *See*—
Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,508,912, Cl. 549-253.000.
Takeda, Keisou; and Hirata, Toshiyuki, to Toyota Jidosha Kabushiki Kaisha. Heater coolant circulation system for vehicle providing matched heating for intake system and passenger compartment. 4,508,264, Cl. 237-12.30B.
Takeda, Takeshi; Machida, Yasuhiko; Kudoh, Yasuo; and Ikegaya, Kazutoshi, to Matsushita Electric Industrial Co., Ltd. Heat storage materials. 4,508,632, Cl. 252-70.000.
Takei, Yutaka; and Somezawa, Masashi, to Sony Corporation. Method for manufacturing a magnetic recording medium. 4,508,752, Cl. 427-48.000.
Takekawa, Junjiro: *See*—
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, 4,508,680, Cl. 419-5.000.
Takenaka Doboku Co., Ltd.: *See*—
Sakuta, Masaharu; Kiya, Soichi; Uchizaki, Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, 4,508,572, Cl. 106-90.000.
Takenaka Komuten Co., Ltd.: *See*—
Sakuta, Masaharu; Kiya, Soichi; Uchizaki, Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, 4,508,572, Cl. 106-90.000.
Takeuchi, Hirosato; and Mikiya, Toshio, to Nitto Kohki Co., Ltd. Retaining device for an inner tube of an evacuated double-tubing type solar heat collector. 4,508,104, Cl. 126-443.000.
Takeuchi, Nobuo; Kaneko, Tadashi; Nakazumi, Tadataka; and Yokooku, Katsuhiko, to Mazda Motor Corporation. Electrically operated engine throttle valve actuating device. 4,508,078, Cl. 123-399.000.
Takigen Zeizous Co., Ltd.: *See*—
Takasaki, Kunihiko, 4,508,377, Cl. 292-166.000.
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Process for the preparation of highly sized paper. 4,508,751, Cl. 427-44.000.
Tamai, Katsumi: *See*—
Kamada, Kazumasa; Tamai, Katsumi; Shimomura, Yasunori; and Abe, Kazunori, 4,509,163, Cl. 369-284.000.
Tamaqua Cable Products Corporation: *See*—
French, Terry M., 4,508,500, Cl. 425-388.000.
Tamm, Horst: *See*—
Kimpel, Rolf-Dieter; Rauterberg, Ulf; and Tamm, Horst, 4,509,025, Cl. 335-85.000.
Tamura, Yoshiharu, to Nippon Electric Co., Ltd. Miniaturized antenna duplexer using SAW filter. 4,509,165, Cl. 370-38.000.
Tamura, Yoshio; Ito, Takaaki; and Morino, Toshiharu, to Toyota Jidosha Kabushiki Kaisha; and Aisan Industry Co., Ltd. Variable venturi-type carburetor. 4,508,664, Cl. 261-44.00C.
Tanabe Seiyaku Co., Ltd.: *See*—
Yoneda, Naoto; Kato, Jyoji; Hayashi, Kimiaki; Ochiai, Takashi; and Kinashi, Keizo, 4,508,727, Cl. 514-398.000.
Tanaka, Hideki: *See*—
Oda, Tatsuro; Tanaka, Hideki; Yoshioka, Sadashichi; and Yokooku, Katsuhiko, 4,508,076, Cl. 123-339.000.
Tanaka, Hiroshi; and Iwata, Yoshitaka, to Mitsubishi Keikinzoku Kogyo Kabushiki Kaisha. Mirrors and method of manufacturing the same. 4,508,425, Cl. 350-641.000.
Tanaka, Kiichiro: *See*—
Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,508,912, Cl. 549-253.000.

Tanaka, Masanori: *See—*
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, 4,509,064, Cl. 346-207.000.
Tanaka, Tatsuo; and Kawamura, Toshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Refrigerating systems having differential valve to control condenser outflow. 4,507,934, Cl. 62-210.000.
Tanaka, Toshinori; and Morishita, Akira, to Mitsubishi Denki Kabushiki Kaisha. Starter. 4,507,978, Cl. 74-7.00E.
Tanaka, Tsutomu; Yahagi, Mitsuhisa; and Watanabe, Shuichi, to Bridgestone Corporation. Pneumatic tires. 4,508,153, Cl. 152-362.0CS.
Tanaka, Yasuo: *See—*
Kusui, Akio; Morita, Shuji; Kudoh, Toshio; Tanaka, Yasuo; and Itoh, Hirotaka, 4,508,414, Cl. 339-143.00R.
Tanaka, Yutaka: *See—*
Fujimura, Yasushi; Okada, Takashi; Tanaka, Yutaka; and Ikeda, Yasunari, 4,509,071, Cl. 358-11.000.
Tanimura, Nobuyoshi; Yamamoto, Sho; Yoshizaki, Kazuo; and Akima, Isao, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. High speed semiconductor memory device having a high gain sense amplifier. 4,509,147, Cl. 365-190.000.
Tappan, Pam R.: *See—*
Tappan, R. Warner; and Tappan, Pam R., 4,508,319, Cl. 256-19.000.
Tappan, R. Warner; and Tappan, Pam R. Bender board mounting system. 4,508,319, Cl. 256-19.000.
Tarrant, Thomas G. Three part diskette labeling system. 4,507,883, Cl. 40-2.00R.
Tarui, Yuichi; and Obayashi, Toshio, to Marusho Industrial Co., Ltd. Protective coating stripping apparatus. 4,508,589, Cl. 156-584.000.
Tarzia, Giorgio: *See—*
Mariani, Luigi; and Tarzia, Giorgio, 4,508,730, Cl. 514-218.000.
Tatano, Masayoshi: *See—*
Irie, Taisuke; Nakagawa, Yoshitaka; Tatano, Masayoshi; Watanabe, Koichi; and Watanabe, Eiji, 4,508,600, Cl. 204-27.000.
Tatonetti, Mario B.: *See—*
Stratton, Leo M.; Sipple, Kenneth J.; and Tatonetti, Mario B., 4,507,965, Cl. 73-517.00B.
Tatsumi, Kazuaki: *See—*
Murakami, Tsudoi; Nasu, Shoji; Tatsumi, Kazuaki; and Nagahama, Yasuhide, 4,508,953, Cl. 219-125.100.
Taube, Thomas: *See—*
Lades, Hans; Fink, Friedrich; Liebel, Siegfried; Lauterbach, Inge; Taube, Thomas; and Zollner, Dieter, 4,509,178, Cl. 373-93.000.
Taylor, Chandler R., Jr.; and Stauffer, Harold F., Jr., to A. H. Robins Company, Inc. Aryloxymethylpyrrolidinols and piperidinols having antidepressant, antiarrhythmic or hypotensive activity. 4,508,724, Cl. 514-317.000.
Taylor, Noel R.; and Taylor, Paul A., to CMD Enterprises, Inc. Automatic load seeking control for a pumpjack motor. 4,508,487, Cl. 417-12.000.
Taylor, Paul A.: *See—*
Taylor, Noel R.; and Taylor, Paul A., 4,508,487, Cl. 417-12.000.
Taylor, Paul D.; and Mocella, Michael T., to Atlantic Richfield Company. Oxidation of hydrocarbons. 4,508,923, Cl. 568-311.000.
Taylor, Stephen C., to Imperial Chemical Industries, PLC. Biochemical process. 4,508,822, Cl. 435-155.000.
Taylor, William M.; and Williams, Bolie C., III, to Cameron Iron Works, Inc. Ram-type blowout preventer. 4,508,312, Cl. 251-1.00A.
Technic, Inc.: *See—*
Johnson, Frank; Reese, Dieter; and Hirbour, Louis, 4,508,611, Cl. 204-202.000.
Technology Consulting Corporation: *See—*
Steiner, Erwin; and Stahlecker, Peter H., 4,507,832, Cl. 28-248.000.
Teckentrup, Hermann; and Hoffmann, Wilhelm, to AEG-Kanis Turbinenfabrik GmbH. Rotor rotating device for driving or driven machines. 4,507,926, Cl. 60-656.000.
Tecumseh Products Company: *See—*
Kandler, William C., 4,507,917, Cl. 60-323.000.
Teetz, Volker: *See—*
Heber, Helmut; Eberle, Reinhard; and Teetz, Volker, 4,508,644, Cl. 260-112.50R.
Tek-Matik, Inc.: *See—*
Bolle, Fred; Herronen, John R.; and Wright, Joseph M., 4,508,212, Cl. 198-781.000.
Tektronix, Inc.: *See—*
Mossaides, Paula X., 4,509,043, Cl. 340-721.000.
Temple, John D., to ASE (UK) Limited. Adjustable seat belt anchorage. 4,508,363, Cl. 280-808.000.
Templeton, James H., to Texaco Development Corporation. Process for the simultaneous production of 2-(2-aminoalkoxy)alkanol and morpholine. 4,508,896, Cl. 544-106.000.
Terashima, Masayuki: *See—*
Ohnishi, Kouhei; Ashikaga, Tadashi; and Terashima, Masayuki, 4,509,003, Cl. 318-800.000.
Tetsuta, Setsuya: *See—*
Najima, Tetsuo; Tetsuta, Setsuya; Sawata, Yukitaka; and Yamagishi, Masahiro, 4,508,620, Cl. 209-500.000.
Teumer, Henry E. Top-entry check valve. 4,508,139, Cl. 137-315.000.
Teva Pharmaceutical Industries Ltd.: *See—*
Sulitzeanu, Bernard, 4,508,829, Cl. 436-510.000.
Texaco Development Corporation: *See—*
Templeton, James H., 4,508,896, Cl. 544-106.000.
Texaco Inc.: *See—*
Kaufman, Benjamin J.; and Sung, Rodney L., 4,508,541, Cl. 44-71.000.
Mims, Donald S.; and Allen, Richard S., 4,508,172, Cl. 166-303.000.
Texas Industries, Inc.: *See—*
Harris, Philip H., 4,508,573, Cl. 106-100.000.
Texas Instruments Incorporated: *See—*
Childers, Jimmie D., 4,509,142, Cl. 364-900.000.
Joyner, Keith A.; and Foster, Ronald B., 4,507,851, Cl. 29-590.000.
McDavid, James M., 4,507,853, Cl. 29-591.000.
Reddy, Chitranjan N., 4,508,978, Cl. 307-482.000.
TG Strips, Inc.: *See—*
Granryd, Thorvald G., 4,508,150, Cl. 152-169.000.
Th. Kieserling & Albrecht: *See—*
Lorenz, Horst; and Schulte, Richard, 4,508,255, Cl. 228-5.100.
Theodore, Paris. Firearm training system. 4,508,508, Cl. 434-19.000.
Thermatool Corporation: *See—*
Rudd, Wallace C., 4,508,949, Cl. 219-61.200.
Therrien, Roger H., to NCR Canada Ltd-NCR Canada LTEE. Automatic, self-diagnosing, electro-optical imaging system. 4,509,077, Cl. 358-139.000.
Thijssen, Henricus A. C.; and van der Malen, Bernardus G. M., to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V. Process for countercurrent crystallization with recirculation. 4,508,553, Cl. 62-541.000.
Thomas, Eugene W.: *See—*
Belliveau, Dennis A.; and Thomas, Eugene W., 4,508,157, Cl. 164-63.000.
Thos. Hill & Company Limited: *See—*
Preedy, John R., 4,508,208, Cl. 198-751.000.
Thomas, William M.: *See—*
Moore, John W.; and Thomas, William M., 4,508,206, Cl. 198-365.000.
Thompson, Hugh A.: *See—*
Radel, Clifford J.; and Thompson, Hugh A., 4,508,256, Cl. 228-152.000.
Thompson, Lincoln. Hose end spray nozzle. 4,508,272, Cl. 239-318.000.
Thompson, William L.: *See—*
Keyes, Marion A.; and Thompson, William L., 4,509,041, Cl. 340-578.000.
Thomson-CSF: *See—*
Broussoux, Dominique; Facoetti, Hugues; and Micheron, Francois, 4,508,668, Cl. 264-22.000.
Buhart, Andre , 4,509,152, Cl. 367-123.000.
Camps, Marcel; Douillard, Alain; Dubois, Jean-Claude; Gazard, Maryse; Montheard, Jean-Pierre; Pascal, Thierry; and Seytre, Gerard, 4,508,639, Cl. 252-500.000.
Carpe, Michel; Collin, Claude; and Pontif, Marc, 4,509,206, Cl. 455-245.000.
Luginbuhl, Pierre; Parniere, Alain; and Argintaru, Lazare, 4,509,200, Cl. 455-12.000.
Thornblom, Jan: *See—*
Santen, Sven; and Thornblom, Jan, 4,508,040, Cl. 110-347.000.
Thorne, Keith. Fishing rod indicator. 4,507,890, Cl. 43-17.000.
Thornley, W. Ray; Wiser, James G.; and Lundahl, E. Cordell, to Ezra C. Lundahl, Inc. Automatic sonar activated height control for a header. 4,507,910, Cl. 56-10.200.
Thornton, Paul A.: *See—*
Houlbrook, Kenneth; and Thornton, Paul A., 4,508,245, Cl. 222-327.000.
Thrall Car Manufacturing Company: *See—*
Biegel, Robert A., 4,508,197, Cl. 188-47.000.
Throckmorton, Morford C., to Goodyear Tire & Rubber Company, The. Process for nonaqueous dispersion polymerization of butadiene in the presence of polymeric dispersing agents. 4,508,881, Cl. 526-201.000.
Thummel, Rudolph C.: *See—*
Riebli, Peter; Fischer, Hanspeter; Thummel, Rudolph C.; and Hubele, Adolf, 4,508,731, Cl. 514-472.000.
Thurston, John F., to Garrett Corporation, The. Fuel mass flow measurement and control system. 4,508,127, Cl. 137-8.000.
Thyssen Aktiengesellschaft vorm. August Thyssen-Hutte: *See—*
Bauer, Gerhard; Hees, Eckart; and Beckers, Karl-Dieter, 4,508,241, Cl. 222-600.000.
Thyssen-Bornemisza, Inc.: *See—*
Choinski, Graydon J.; and Brooks, Dave W., 4,508,018, Cl. 92-128.000.
Tinker, Charles L., to Peabody ABC Corporation. Ventiiation fan with noise-attenuating housing. 4,508,486, Cl. 415-119.000.
Titan Tool Inc.: *See—*
Malcolm, David H., 4,508,276, Cl. 239-691.000.
Tittmann, Frederick R. Doctor apparatus for coating machine. 4,508,050, Cl. 118-118.000.
TL Systems Corporation: *See—*
Trechsel, Hans W.; Larson, Allan B.; and Ryerse, John A., 4,508,148, Cl. 141-147.000.
TMC Corporation: *See—*
Svoboda, Josef; Nitschko, Theodor; and Wittmann, Heinz, 4,508,361, Cl. 280-628.000.
Toda, Toshiharu: *See—*
Kawanami, Norihide; Miyake, Yukinori; Kawamura, Kenji; and Toda, Toshiharu, 4,509,090, Cl. 361-119.000.
Todoko, Masaaki; and Watanabe, Hiroyuki, to Toyo Soda Manufacturing Co., Ltd. Process for producing a high purity cyclized polymer of isoprene. 4,508,877, Cl. 525-333.100.
Tofukuji, Ikuo: *See—*
Matsuzaki, Minoru; Hachimoto, Akihiko; Inoue, Takashi; Shirai, Hitoshi; Watanabe, Akira; and Tofukuji, Ikuo, 4,508,443, Cl. 354-402.000.

Togari, Hisashi, to Nippon Electric Co., Ltd. Single-ended push-pull circuit having a small through-current. 4,508,979, Cl. 307-513.000.
Toho Beslon Co., Ltd.: *See*—
Izumi, Kazuo; Shimazaki, Kenji; and Seki, Kenji, 4,508,851, Cl. 502-426.000.
Toke, Laszlo : *See*—
Fogassy, Elemer; Toke, Laszlo ; Faigl, Ferenc; Soos, Rudolf; Bozzay, Jozsef; Kolta, Rezso; Nemes, Jozsef; and Bencsik, Peter, 4,508,919, Cl. 562-401.000.
Tokoli, Emery G.; Horgan, Anthony M.; and Carmichael, Kathleen M., to Xerox Corporation. Process for the preparation of high purity phthalocyanine pigments. 4,508,650, Cl. 260-245.860.
Tokuno, Masateru; and Sawata, Tetsuya, to Rengo Co., Ltd. Surface winder. 4,508,279, Cl. 242-56.00R.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Asano, Masamichi; and Iwahashi, Hiroshi, 4,509,148, Cl. 365-230.000.
Fujioka, Yoshiharu; Onuki, Akio; and Sakamoto, Tomio, 4,509,084, Cl. 360-84.000.
Harata, Mituo; Hiraki, Hideaki; Uno, Shigeki; Sakuma, Kazuo; and Matsunaga, Kiyosi, 4,509,035, Cl. 338-35.000.
Kimoto, Katsumi, 4,509,154, Cl. 369-33.000.
Kohyama, Mitsuaki, 4,508,052, Cl. 118-651.000.
Koyama, Toshihiro; Anbe, Yoshiharu; and Funahashi, Takuo, 4,507,946, Cl. 72-17.000.
Minami, Kenji; Katagiri, Masaru; and Noguchi, Hideo, 4,509,067, Cl. 357-13.000.
Monden, Tsuneo; Ozu, Masao; and Ikegami, Satoshi, 4,508,495, Cl. 418-63.000.
Morinaga, Kaoru, 4,509,157, Cl. 369-75.200.
Naya, Masaru; and Ikeda, Tsuneichi, 4,508,023, Cl. 99-279.000.
Ohno, Junichi, 4,507,846, Cl. 29-571.000.
Shinozaki, Satoshi, 4,507,849, Cl. 29-576.00W.
Suzuki, Seigo, 4,509,188, Cl. 381-53.000.
Tanaka, Tatsuo; and Kawamura, Toshiaki, 4,507,934, Cl. 62-210.000.
Wada, Hitoshi; Tachikawa, Kyoji; Yamada, Yutaka; and Murase, Satoru, 4,508,578, Cl. 148-11.50F.
Tokyo Shubaura Denki Kabushiki Kaisha: *See*—
Sugimoto, Hiroshi; and Satoh, Kozo, 4,509,011, Cl. 324-309.000.
Tokyu Musashi Mfg. Co., Ltd.: *See*—
Suzuki, Tetsuo, 4,508,057, Cl. 119-3.000.
Tomczak, Stanislaus: *See*—
Weiss, Gunther; Worz, Paul; and Tomczak, Stanislaus, 4,509,033, Cl. 336-107.000.
Tomino, Tadashi; and Higuchi, Masayuki, to Sharp Kabushiki Kaisha. Integrated circuit package and display panel. 4,508,402, Cl. 339-17.0CF.
Tong, Francis F.; and Vaughter, Harmon P., to Zenith Electronics Corporation. UHF RF Amplifier and AGC system. 4,509,207, Cl. 455-251.000.
Tong, Mathias: *See*—
Boissel, Pierre; and Tong, Mathias, 4,508,967, Cl. 250-396.00R.
Topliss, John G.: *See*—
Sircar, Ila; Cain, Michael H.; and Topliss, John G., 4,508,718, Cl. 514-238.000.
Toray Industries, Inc.: *See*—
Miura, Yasuki; Motegi, Masahiko; and Okabe, Kazuo, 4,508,782, Cl. 428-409.000.
Yasuhara, Yutaka; Nishino, Masaki; and Matsuhisa, Seikichi, 4,508,918, Cl. 560-241.000.
Torley, Jozsef: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,508,926, Cl. 568-766.000.
Toshiba Corporation: *See*—
Sekigawa, Tatsuaki; Gotoh, Akio; Tsutsumi, Syuitsu; Marui, Kuniyoshi; and Honda, Naoto, 4,509,201, Cl. 455-73.000.
Toth, Douglas J., to Under Sea Industries, Inc. Diaphragm assembly for scuba diving regulator. 4,508,118, Cl. 128-204.260.
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, to Richter Gedeon Vegyeszeti Gyar Rt. 4-Hydroxy-benzhydrols, process for their preparation and pharmaceutical compositions containing them. 4,508,926, Cl. 568-766.000.
Toth, Tibor, to Behringwerke Aktiengesellschaft. Anti-streptolysin O latex reagent and process for the preparation thereof. 4,508,831, Cl. 436-512.000.
Totoku Co., Ltd.: *See*—
Morimoto, Tsuyoshi, 4,508,321, Cl. 256-65.000.
Touchon, Pierre: *See*—
Aubry, Claude; Chaumette, Jacques; and Touchon, Pierre, 4,508,783, Cl. 428-410.000.
Towmotor Corporation: *See*—
Melocik, Grant C.; and Pickering, William, 4,508,999, Cl. 318-331.000.
Toyo Kohan Co., Ltd.: *See*—
Nemoto, Tadashi; Fukumoto, Ryoichi; Kawamura, Hiroaki; Kondo, Yoshikazu; and Inui, Tsuneo, 4,508,601, Cl. 204-38.500.
Shimizu, Nobuyoshi; Fujimoto, Terunori; Inui, Tsuneo; and Ishida, Masatoki, 4,508,790, Cl. 428-632.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,508,481, Cl. 413-1.000.
Kumasaka, Hideo; and Fujisawa, Kazuo, 4,508,569, Cl. 106-14.120.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Todoko, Masaaki; and Watanabe, Hiroyuki, 4,508,877, Cl. 525-333.100.
Toyota Jidosha Kabushiki Kaisha: *See*—
Fujiwara, Kousyun, 4,508,254, Cl. 227-116.000.
Ito, Toshimitsu; and Norota, Kazuhiko, 4,508,086, Cl. 123-492.000.
Miura, Hirohisa; Satou, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,508,682, Cl. 420-590.000.
Takami, Toshihiro; and Isobe, Masahiro, 4,508,072, Cl. 123-195.00C.
Takeda, Keisou; and Hirata, Toshiyuki, 4,508,264, Cl. 237-12.30B.
Tamura, Yoshio; Ito, Takaaki; and Morino, Toshiharu, 4,508,664, Cl. 261-44.00C.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Numazawa, Akio; Sakai, Ichio; Kumagai, Tadanobu; and Nishikawa, Seiichi, 4,508,522, Cl. 464-11.000.
Trabbic, Thomas D. Hydraulic device. 4,507,923, Cl. 60-583.000.
Tracor Hydronautics, Inc.: *See*—
Conn, Andrew F.; Lindenmuth, William T.; and Frederick, Gary S., 4,508,577, Cl. 134-1.000.
Tracy, John M.: *See*—
Gunning, William J., III; and Tracy, John M., 4,508,964, Cl. 250-201.000.
Traugott, Stephen C.: *See*—
Djordjevic, Borislav B.; and Traugott, Stephen C., 4,507,969, Cl. 73-644.000.
Trechsel, Hans W.; Larson, Allan B.; and Ryerse, John A., to TL Systems Corporation. Pharmaceutical filler apparatus. 4,508,148, Cl. 141-147.000.
Treiber, Fritz F., to Hobart Corporation. Film and package handling apparatus for wrapping machine. 4,507,904, Cl. 53-203.000.
Trescher, Viktor: *See*—
Stopp, Gerhard; Karkossa, Horst; and Trescher, Viktor, 4,508,920, Cl. 562-423.000.
Treutlein, Dieter: *See*—
Hofmann, Heinrich; and Treutlein, Dieter, 4,508,397, Cl. 384-510.000.
Tricerri, Silvia Z.; Casagrande, Cesare; De Marchi, Franco; and Nicola, Massimo, to Pierrel S.p.A. Hydroxyimino and alkoxyimino derivatives of 1,4-dihydropyridine and anti-hypertensive compositions. 4,508,719, Cl. 514-236.000.
Triolo, Philip M.: *See*—
Andrade, Joseph D.; Triolo, Philip M.; Smith, Lee M.; and Miller, Frank J., 4,508,606, Cl. 204-169.000.
Tromp, Wouter T.: *See*—
Bittner, Franz; Poortman, Boudewijn J.; Rademacher-Dubbick, Kristian; Roskam, Abram K.; Stevens, Udo; and Tromp, Wouter T., 4,507,975, Cl. 73-861.120.
TRW Inc.: *See*—
McIver, George W.; Nakano, Kenichi; and Berenz, John J., 4,507,845, Cl. 29-571.000.
Rau, Jim L., 4,507,920, Cl. 60-443.000.
Tsao, Kuey-Yeou: *See*—
Busta, Heinz H.; Tsao, Kuey-Yeou; White, Wayne D.; and Loeppert, Peter V., 4,508,613, Cl. 204-418.000.
TSE International: *See*—
Plater, Robert J., 4,508,281, Cl. 242-54.00R.
Tsipenyuk, Pyotr: *See*—
Weltman, David; and Tsipenyuk, Pyotr, 4,508,403, Cl. 339-28.000.
Tsipov, Mikhail E. Shower valve. 4,508,141, Cl. 137-560.000.
Tsividis, Yannis: *See*—
Banu, Mihai; and Tsividis, Yannis, 4,509,019, Cl. 330-107.000.
Tsuchiya, Yuzoh: *See*—
Harada, Kazuhiro; Tsuchiya, Yuzoh; Sekiguchi, Nobuo; and Ishikawa, Toshio, 4,508,251, Cl. 226-25.000.
Tsuji, Sadahiko: *See*—
Kitagishi, Nozomu; and Tsuji, Sadahiko, 4,508,433, Cl. 350-454.000.
Tsuji, Shinsaku: *See*—
Nishiyama, Taichiro; and Tsuji, Shinsaku, 4,507,980, Cl. 74-473.00R.
Tsumoto, Akio; and Kano, Hisae, to Nissan Motor Company, Limited. Gutter structure for a vehicle body. 4,508,382, Cl. 296-213.000.
Tsutsumi, Syuitsu: *See*—
Sekigawa, Tatsuaki; Gotoh, Akio; Tsutsumi, Syuitsu; Marui, Kuniyoshi; and Honda, Naoto, 4,509,201, Cl. 455-73.000.
Tubing Testors, Inc.: *See*—
Boutwell, Johnie R., 4,507,954, Cl. 73-40.700.
Tuggle, Lloyd H.; and Ferlito, Michael J., to Emerson Electric Co. Fuel mixture enrichment system for internal combustion engine. 4,508,068, Cl. 123-187.50R.
Tukamoto, Kenkichi. Needle. 4,508,119, Cl. 128-329.00A.
Tulenko, William, Jr. Collapsible end table. 4,508,038, Cl. 108-135.000.
Turek, Evan J.: *See*—
Fulger, Charles V.; Stahl, Howard D.; Turek, Evan J.; and Bayha, Renee, 4,508,745, Cl. 426-594.000.
Turner, Michael J. B.: *See*—
Berry, Paul S.; Kettlewell, Peter J.; and Turner, Michael J. B., 4,508,062, Cl. 119-82.000.
Turner, Robert; and Seabrook, Robert A., to Ford Motor Company. Steering column assembly. 4,507,982, Cl. 74-493.000.
Tuss, John J., to Warner & Swasey Company, The. Coordinate measuring machine with a self aligning pneumatic counterbalance. 4,507,868, Cl. 33-1.00M.
UBE Industries, Ltd.: *See*—
Inaike, Toshihiro; Ushimi, Katsuhiko; Yamamoto, Shuji; and Inoue, Toshihiro, 4,508,766, Cl. 427-388.200.

Uchiyama, Shintaro, to Fuji Jukogyo Kabushiki Kaisha. Shift device for operating a transmission for a four-wheel drive vehicle. 4,508,190, Cl. 180-247.000.
Uchizaki, Iwao: *See*—
Sakuta, Masaharu; Kiya, Soichi; Uchizaki, Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, 4,508,572, Cl. 106-90.000.
Ueda, Atsushi: *See*—
Komurasaki, Satoshi; Ueda, Atsushi; Morimoto, Yoshinobu; and Kadota, Youichi, 4,508,079, Cl. 123-425.000.
Ueda, Kaichi: *See*—
Madarame, Michimasa; and Ueda, Kaichi, 4,507,935, Cl. 62-227.000.
Ueda, Nobuhiro: *See*—
Wakabayashi, Noriaki; Fukumoto, Terumichi; and Ueda, Nobuhiro, 4,509,001, Cl. 318-687.000.
Ueno, Hiroshi: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,508,481, Cl. 413-1.000.
Uenozono, Hiroko: *See*—
Fujii, Tadashi; Yamaguchi, Tomoyuki; Murakami, Kakuji; Kawakami, Tomiko; and Uenozono, Hiroko, 4,508,570, Cl. 106-20.000.
Ueoka, Isao: *See*—
Miyake, Masayoshi; Ueoka, Isao; Kawaguchi, Munetaka; Nakabayashi, Hirohiko; and Yamamoto, Teruyuki, 4,508,779, Cl. 428-383.000.
Uffner, William E.: *See*—
Muncaster, John W.; Roberts, Michael G.; Rowlett, R. David; Hoitink, Todd B.; Uffner, William E.; and White, Robert N., 4,508,770, Cl. 428-63.000.
Uhl, Jurgen: *See*—
Hausberg, Hans-Heinrich; Prucher, Helmut; Uhl, Jurgen; Seyfried, Christoph; and Minck, Klaus, 4,508,732, Cl. 514-466.000.
Ukihashi, Hiroshi; Asawa, Tatsuro; Yamabe, Masaaki; and Miyake, Haruhisa, to Asahi Glass Company Ltd. Fluorinated cation exchange membrane and use thereof in electrolysis of an alkali metal halide. 4,508,603, Cl. 204-98.000.
Ultramed, Inc.: *See*—
Gardineer, Bayard; and Vilkomerson, David, 4,508,122, Cl. 128-660.000.
Umeda, Jun-ichi; Nakashima, Hisao; Kajimura, Takashi; and Kuroda, Takao, to Hitachi, Ltd. Phase-locked semiconductor laser device. 4,509,173, Cl. 372-50.000.
Umeda, Yasukazu: *See*—
Tajima, Shinobu; Umeda, Yasukazu; and Kamohara, Toshiyuki, 4,509,143, Cl. 364-900.000.
Umino, Isamu: *See*—
Sogo, Hiroyuki; Ohsawa, Zenichi; Umino, Isamu; and Nishida, Haruki, 4,509,208, Cl. 455-317.000.
Under Sea Industries, Inc.: *See*—
Toth, Douglas J., 4,508,118, Cl. 128-204.260.
Union Carbide Corporation: *See*—
Beran, Debra L.; Cann, Kevin J.; Jorgensen, Robert J.; Karol, Frederick J.; Maraschin, Norma J.; and Marcinkowsky, Arthur E., 4,508,842, Cl. 502-112.000.
Goddard, John B.; and Johnson, William N., 4,508,701, Cl. 423-61.000.
Union Oil Company of California: *See*—
Fenton, Donald M.; Delaney, Dennis D.; and Bingham, F. Emmett, 4,508,537, Cl. 23-293.00S.
Young, Donald C., 4,508,558, Cl. 71-30.000.
United Kingdom Atomic Energy Authority: *See*—
Moseley, Patrick T.; and Bridger, Nevill J., 4,507,855, Cl. 29-623.100.
Moseley, Patrick T.; and Hill, Michael R. H., 4,508,147, Cl. 141-1.100.
United States of America
Agriculture: *See*—
Bean, Maura M.; Nishita, Kazuko D.; and Hoops, Elizabeth A., 4,508,736, Cl. 426-19.000.
Yagi, Toshiharu; and Pavlath, Attila E., 4,508,781, Cl. 428-409.000.
Air Force: *See*—
Schack, Carl J.; and Christe, Karl O., 4,508,662, Cl. 260-550.000.
Army: *See*—
Jacobs, Harold; Dixon, Samuel, Jr.; and Malecki, Edmund E., 4,509,009, Cl. 324-95.000.
Sayles, David C., 4,508,929, Cl. 568-923.000.
Swarthout, Richard L., 4,508,215, Cl. 206-3.000.
Energy: *See*—
Barclay, John A., 4,507,927, Cl. 62-3.000.
Delnick, Frank M.; Guidotti, Ronald A.; and McCarthy, David K., 4,508,796, Cl. 429-112.000.
Knoedler, Reinhard; Nelson, Paul A.; Shimotake, Hiroshi; and Battles, James E., 4,508,797, Cl. 429-184.000.
Kruse, Lyle W., 4,509,042, Cl. 340-600.000.
Russell, Janet A.; and Riemath, William F., 4,508,886, Cl. 528-1.000.
Health and Human Services: *See*—
Merril, Carl R.; and Goldman, David, 4,508,820, Cl. 435-29.000.
National Aeronautics and Space Administration: *See*—
Clark, Keith H., 4,508,296, Cl. 244-158.00R.
Jain, Atul, 4,509,048, Cl. 343-5.0CM.
Johnson, Dean L., 4,507,928, Cl. 62-3.000.
Kavaya, Michael J., 4,509,132, Cl. 364-571.000.
Menzies, Robert T.; and Rutledge, Charles W., 4,509,130, Cl. 364-556.000.
Navy: *See*—
Elton, Raymond C.; Dixon, Robert H.; and Ford, James L., 4,508,055, Cl. 118-724.000.
Karwacki, Francis A.; and Griffin, Joseph, 4,509,014, Cl. 324-305.000.
Krasnjanski, David, 4,509,131, Cl. 364-565.000.
Lewis, Bernard L., 4,509,051, Cl. 343-17.2PC.
Lorch, Daniel L., 4,508,294, Cl. 244-122.0AG.
Ramirez, Joe D.; Gorin, Steven E.; and Garnett, William A., 4,508,490, Cl. 417-234.000.
U.S. Philips Corporation: *See*—
Bohlen, Heinz; and Demmel, Enzio, 4,508,992, Cl. 315-5.390.
Gravesteijn, Dirk J.; Steenbergen, Christiaan; Van der Veen, Jan; and Nijssen, Wilhelmus P. M., 4,508,811, Cl. 430-270.000.
Jager, Lothar; Peter, Anton; and Winkler, Reinhard, 4,509,087, Cl. 360-130.210.
Kasperkovitz, Wolfdietrich G., 4,509,205, Cl. 455-194.000.
Kroner, Klaus, 4,509,082, Cl. 360-37.100.
Post, Sieghard, 4,509,032, Cl. 336-59.000.
Ridel, Philippe, 4,509,022, Cl. 330-284.000.
Stockdale, Trevor J., 4,508,451, Cl. 356-315.000.
Van de Leest, Renaat E.; and Gijsbers, Jan C., 4,509,161, Cl. 369-275.000.
van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,509,020, Cl. 330-274.000.
Van Hoff, Isidoor K.; and Van Den Bergh, Johannes H. P. M., 4,508,791, Cl. 428-663.000.
van Uden, Albertus J. P. M., 4,509,021, Cl. 330-282.000.
Zebrowski, Tadeusz, 4,507,979, Cl. 74-89.220.
United States Surgical Corporation: *See*—
Green, David T., 4,508,253, Cl. 227-19.000.
U.S. Truck Cranes, Inc.: *See*—
Shoff, Bernell D., 4,508,014, Cl. 91-527.000.
United Technologies Corporation: *See*—
Amoroso, Salvatore, Jr.; and Conklin, Russell W., 4,509,050, Cl. 343-5.0SM.
Levesque, Adelard, Jr.; and Rembold, John P., 4,509,110, Cl. 364-153.000.
Universal Instruments Corporation: *See*—
Kukowski, John A.; Soth, Henry J.; and Gay, William H., 4,507,862, Cl. 29-837.000.
University of Georgia Research Foundation, Inc.: *See*—
Booth, Nicholas H.; Hatch, Roger C.; and Crawford, Lester M., 4,508,715, Cl. 514-280.000.
University of Kentucky Research Foundation: *See*—
Duncan, George A., 4,508,482, Cl. 414-26.000.
University of Tennessee Research Corporation: *See*—
Mamantov, Gleb, 4,508,795, Cl. 429-103.000.
University Patents, Inc.: *See*—
Mochel, Margaret E.; and Humphreys, Colin J., 4,508,952, Cl. 219-121.0EH.
Uno, Hiroshi: *See*—
Uno, Tadao; and Uno, Hiroshi, 4,508,527, Cl. 493-357.000.
Uno, Shigeki: *See*—
Harata, Mituo; Hiraki, Hideaki; Uno, Shigeki; Sakuma, Kazuo; and Matsunaga, Kiyosi, 4,509,035, Cl. 338-35.000.
Uno, Tadao; and Uno, Hiroshi. Method and apparatus for quantitatively dividing zigzag folded sheet of paper. 4,508,527, Cl. 493-357.000.
Uozumi, Osamu, to Ricoh Company, Ltd. Sheet separation system for thermal transfer type recording apparatus. 4,509,060, Cl. 346-76.0PH.
Upjohn Company, The: *See*—
Coleman, James H., 4,508,726, Cl. 514-220.000.
Kaplan, Lester J., 4,508,911, Cl. 548-407.000.
Ushimi, Katsuhiko: *See*—
Inaike, Toshihiro; Ushimi, Katsuhiko; Yamamoto, Shuji; and Inoue, Toshihiro, 4,508,766, Cl. 427-388.200.
Ushio Denki Kabushiki Kaisha: *See*—
Arai, Tetsuji, 4,508,960, Cl. 219-388.000.
Uskokovic, Milan R.: *See*—
Baggiolini, Enrico G.; Batcho, Andrew D.; Boris, Alfred; and Uskokovic, Milan R., 4,508,651, Cl. 260-397.200.
USM Corporation: *See*—
Prichard, Arthur W., 4,508,956, Cl. 219-215.000.
Usui, Koichi; Ogawa, Masahide; Goto, Kunio; Sato, Teiji; Tanaka, Masanori; Takahashi, Seikichi; Ono, Kinichi; and Kojima, Seiji, to Mizusawa Industrial Chemicals, Ltd. Heat-sensitive recording paper and filler therefor. 4,509,064, Cl. 346-207.000.
Uvex Winter Optik GmbH: *See*—
Stepan, Walter, 4,507,809, Cl. 2-424.000.
Uyama, Shintaro: *See*—
Shimamura, Morihiko; and Uyama, Shintaro, 4,508,009, Cl. 91-376.00R.
V. E. Anderson Mfg. Co.: *See*—
Anderson, Richard N., 4,507,894, Cl. 49-449.000.
Vaccari, Franco; and Balbinot, Renzo, to Nordica S.p.A. Heater device, particularly for ski boots. 4,507,877, Cl. 36-2.600.
Vachek, Josef, to Bodenseewerk Geratetechnik GmbH. Hydraulic filter for eliminating slow pressure fluctuations. 4,507,971, Cl. 73-707.000.
Valeo: *See*—
Herbulot, Jean; and Jumel, Bernard, 4,508,199, Cl. 188-250.00B.
Valley Industries, Inc.: *See*—
Everard, Lloyd D., 4,508,126, Cl. 135-89.000.

Vandamme, Detlef, to Siemens Aktiengesellschaft. Electric motor drive for a slow-running annular rotor of a processing machine. 4,508,986, Cl. 310-67.00R.

Van de Leest, Renaat E.; and Gijsbers, Jan C., to U.S. Philips Corporation. Optically readable information disc provided with a reflective optical structure. 4,509,161, Cl. 369-275.000.

Van Den Bergh, Johannes H. P. M.: *See*—
Van Hoff, Isidoor K.; and Van Den Bergh, Johannes H. P. M., 4,508,791, Cl. 428-663.000.

van de Plassche, Rudy J.; and Dijkmans, Eise C., to U.S. Philips Corporation. Push-pull amplifier. 4,509,020, Cl. 330-274.000.

Vanderkooi, Nicholas, Jr.; Stevenson, Philip E.; and Welgos, Robert J., to Allied Corporation. Process to form amorphous, crystallizable thermoplastic polymers. 4,508,769, Cl. 428-36.000.

van der Lely, Cornelis. Soil cultivating implements. 4,508,179, Cl. 172-49.500.

van der Malen, Bernardus G. M.: *See*—
Thijssen, Henricus A. C.; and van der Malen, Bernardus G. M., 4,508,553, Cl. 62-541.000.

Vandermeerssche, Gaston A. Abrasion testing machine. 4,507,953, Cl. 73-7.000.

Van der Veen, Jan: *See*—
Gravesteijn, Dirk J.; Steenbergen, Christiaan; Van der Veen, Jan; and Nijssen, Wilhelmus P. M., 4,508,811, Cl. 430-270.000.

Vandevoir, Claude A.; and Geiser, Markus, to Sameca S.A. Bar-guidance equipment for an automatic lathe. 4,507,992, Cl. 82-2.700.

van Dijk, Jacob; Renken, Johannes W.; Dekker, Jan G.; and Helmond, Johannes, to National Distillers and Chemical Corporation. Process for the trimerization of unsaturated fatty acids. 4,508,652, Cl. 260-407.000.

Van Hoff, Isidoor K.; and Van Den Bergh, Johannes H. P. M., to U.S. Philips Corporation. Electric wire with a copper, silver, or gold core clad with tungsten, molybdenum or tungsten/molybdenum alloy. 4,508,791, Cl. 428-663.000.

Van Meurs, Hubrecht C. A.: *See*—
Voetter, Heinz; Darton, Richard C.; Van Meurs, Hubrecht C. A.; and Krishna, Rajamani, 4,508,041, Cl. 110-347.000.

Vannier, Chantal: *See*—
Lacour, Bernard; Maillet, Marc; Vannier, Chantal; and de Witte, Olivier, 4,509,174, Cl. 372-82.000.

van Uden, Albertus J. P. M., to U.S. Philips Corporation. Circuit for amplifying and/or attenuating a signal. 4,509,021, Cl. 330-282.000.

VanVoorst, Gene A.: *See*—
Hirsch, John L.; and VanVoorst, Gene A., 4,508,528, Cl. 493-426.000.

Van Wezel, Antonius L., to De Staat Der Nederlanden, Vertegenwoordigd doozde Minister van volksgezondheid en Milieuhygiene. Virus vaccines and process for preparing the same. 4,508,708, Cl. 424-89.000.

Varian Associates, Inc.: *See*—
Holden, Scott C., 4,508,161, Cl 165-1.000.

Vasilia Ltd.: *See*—
Banks, Julia G.; and Ficho, William, 4,508,156, Cl. 164-35.000.

Vaughter, Harmon P.: *See*—
Tong, Francis F.; and Vaughter, Harmon P., 4,509,207, Cl. 455-251.000.

VDO Adolf Schindling AG: *See*—
Hufnagel, Walter; and Kreuz, Alois, 4,507,960, Cl. 73-187.000.
Schlick, Horst; Hofert, Paul; and Caramel, Rudolf, 4,508,458, Cl. 368-76.000.

VE-Wissenschaftlich-Technischer Betrieb Keramik: *See*—
Shinjo, Katsumi, 4,507,859, Cl. 29-798.000.

Vee Arc Corporation: *See*—
Hickman, Mark R.; and Brown, Michael M., 4,508,976, Cl. 307-270.000.

Veiser, Elmar: *See*—
Ramesohl, Hubert; Seelen, Fritz; Filges, Ralf; Schroder, Karlheinz; and Veiser, Elmar, 4,508,503, Cl. 432-109.000.

Venus Scientific Inc.: *See*—
Gallios, George C., 4,509,108, Cl. 363-45.000.

Verderico, Joseph P.: *See*—
Beres, Arthur W.; and Verderico, Joseph P., 4,508,497, Cl. 425-28.00R.

Vereczkey, Laszlo: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,508,926, Cl. 568-766.000.

Vereen, William J. Automated tracking process for manufacturing and inventory. 4,509,123, Cl. 364-300.000.

Verga, Giuseppe: *See*—
Sisti, Giorgio; and Verga, Giuseppe, 4,508,685, Cl. 422-54.000.

Vermilyea, Mark E., to General Electric Company. Correction coil assembly for NMR magnets. 4,509,030, Cl. 335-216.000.

Versic, Ronald J.: *See*—
Olson, Roger; and Versic, Ronald J., 4,508,760, Cl. 427-213.340.

Vetter, Helmut: *See*—
Foll, Eberhard; Holl, Peter; and Vetter, Helmut, 4,508,750, Cl. 427-44.000.

Victor Company of Japan, Limited: *See*—
Masuda, Isao; Nishikawa, Kazunori; Iwasaki, Yoshiki; and Komura, Makoto, 4,509,155, Cl. 369-48.000.

Victor, John G., to Institute of Gas Technology. Ethanol extraction process. 4,508,928, Cl. 568-916.000.

Vieau, Robert G.; and Klempke, William D., to Loram Maintenance of Way, Inc. Grinding head assembly. 4,507,897, Cl. 51-209.00R.

Viljanmaa, Antti K. Drying press for hides. 4,507,943, Cl. 69-41.000.

Vilkomerson, David: *See*—
Gardineer, Bayard; and Vilkomerson, David, 4,508,122, Cl. 128-660.000.

Vincent, Michel; Remond, Georges; and Laubie, Michel, to Adir. Substituted iminodiacids, their preparation and pharmaceutical compositions containing them. 4,508,729, Cl. 514-419.000.

Virgilio, Joseph A.; Manowitz, Milton; and Heilweil, Emanuel, to Givaudan Corporation. 2-Alkyl-3-haloisothiazolium salts and their derivatives. 4,508,908, Cl. 548-213.000.

Viscogliosi, Marcello: *See*—
Schachter, Rozalie; Viscogliosi, Marcello; and Bunz, Lewis A., 4,509,066, Cl. 357-2.000.

Vista Polymers Inc.: *See*—
Rickert, Robert E., 4,507,841, Cl. 29-402.080.

Visual Information Institute, Inc.: *See*—
Harshbarger, John H., 4,509,079, Cl. 358-165.000.

Vittay, Pal: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,508,926, Cl. 568-766.000.

Voetter, Heinz; Darton, Richard C.; Van Meurs, Hubrecht C. A.; and Krishna, Rajamani, to Shell Internationale Research Maatschappij B.V. Process for the combustion of coke present on solid particles and for the production of recoverable heat from hydrocarbon-bearing solid particles and apparatus therefor. 4,508,041, Cl. 110-347.000.

Vogelpohl, David R.: *See*—
Burger, William A.; Embree, David M.; Singer, Martin H.; and Vogelpohl, David R., 4,508,937, Cl. 179-84.00T.

Vogl, Otto: *See*—
Yoshida, Shohei; and Vogl, Otto, 4,508,882, Cl. 526-259.000.

Voisin, Paul H.: *See*—
Lee, Wai-Hon; and Voisin, Paul H., 4,508,808, Cl. 430-146.000.

Volkert, Otto: *See*—
Grabhoefer, Herbert; and Volkert, Otto, 4,508,774, Cl. 428-220.000.

Volkert, Wynn A.: *See*—
Simon, Jaime; Wilson, David A.; and Volkert, Wynn A., 4,508,704, Cl. 424-14.000.

Vollmar, Kurt, to Pfaff Industriemaschinen GmbH. Presser foot device on a sewing machine. 4,508,043, Cl. 112-235.000.

vonBergen, Otto E. Wire fence strand spreader. 4,507,987, Cl. 81-485.000.

von Seyerl, Joachim, to SKW Trostberg Aktiengesellschaft. Agent and method for the stabilization of polyvinyl chloride against heat and light. 4,508,638, Cl. 252-401.000.

Vukovich, William J.: *See*—
Fattic, Gerald T.; and Vukovich, William J., 4,509,125, Cl. 364-424.100.

W. R. Grace & Co.: *See*—
Winyall, Milton E., 4,508,607, Cl. 204-180.00P.

W. Schlafhorst & Co.: *See*—
Kupper, Wilhelm, 4,508,227, Cl. 209-927.000.

Wada, Hideo, to Clarion Co., Ltd. Pointer mechanism. 4,508,048, Cl. 116-291.000.

Wada, Hitoshi; Tachikawa, Kyoji; Yamada, Yutaka; and Murase, Satoru, to National Research Institute; and Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing fine filamentary Nb-Ti based alloy superconducting wire. 4,508,578, Cl. 148-11.50F.

Wakabayashi, Noriaki; Fukumoto, Terumichi; and Ueda, Nobuhiro, to Matsushita Electric Industrial Co., Ltd. Brushless linear servomotor. 4,509,001, Cl. 318-687.000.

Wakeman, Russell J., to Colt Industries Operating Corp. Fuel metering apparatus with multi-stage fuel metering valve assembly. 4,508,091, Cl. 123-586.000.

Waldron, Clifford R.: *See*—
Fairbairn, Leroy W.; and Waldron, Clifford R., 4,507,858, Cl. 29-747.000.

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Campbell, Willis R.; Hunt, Larry J.; and Waldrop, T. William, 4,508,359, Cl. 280-463.000.

Walker, Thad O.; Simpson, Jay P.; and Dearing, Harry L., to O'Brien-Goins-Simpson & Associates. Fast drilling invert emulsion drilling fluids. 4,508,628, Cl. 252-8.50P.

Walkover Limited: *See*—
Ridgeon, Paul W., 4,508,248, Cl. 222-623.000.

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Hansson, Ingvar J. M.; Hakansson, Hakan B.; Igefjord, Magnus G. K.; and Wall, Berth-Ove G., 4,507,854, Cl. 29-612.000.

Wallace, Richard B., to Oakland Corporation, The. Method and apparatus for making friction locking threaded fasteners. 4,508,759, Cl. 427-195.000.

Wallis, Bernard J. Method and apparatus for cutting corrugated strip. 4,507,948, Cl. 72-185.000.

Wang, An; and Brown, Phillip P., to Wang Laboratories, Inc. High density dot matrix printer. 4,508,463, Cl. 400-124.000.

Wang Laboratories, Inc.: *See*—
Cheung, Kin L., 4,509,140, Cl. 364-900.000.
Wang, An; and Brown, Phillip P., 4,508,463, Cl. 400-124.000.

Wang, Tsing-Chow; and Josephs, Richard M., to Sperry Corporation. High density Josephson junction memory circuit. 4,509,146, Cl. 365-162.000.

Ward, Leslie M. Universal joint. 4,508,373, Cl. 285-226.000.

Warncke, Ernst, to Dragerwerk AG. Protective breathing hood for escape purposes. 4,508,115, Cl. 128-201.230.

Warner Electric Brake & Clutch Company: *See*—
Booth, Dwight E., 4,509,091, Cl. 361-154.000.

Warner-Lambert Company: *See*—
Sircar, Ila; Cain, Michael H.; and Topliss, John G., 4,508,718, Cl. 514-238.000.

Warner & Swasey Company, The: *See*—
Silverman, Martin L.; and Shook, Donald P., 4,507,993, Cl. 82-36.00A.
Tuss, John J., 4,507,868, Cl. 33-1.00M.

Warren, Walter R.: *See*—
Hitt, Gerard J.; Nowakowski, Victor A.; and Warren, Walter R. 4,507,962, Cl. 73-384.000.

Wartman, Thomas G., to Minnesota Mining and Manufacturing Company. Light-desensitizable transfer medium with photooxidizable reactant and oxygen-sensitizing dye. 4,508,810, Cl. 430-201.000.

Washington University: *See*—
Needleman, Philip, 4,508,712, Cl. 514-11.000.

Watanabe, Akira: *See*—
Matsuzaki, Minoru; Hachimoto, Akihiko; Inoue, Takashi; Shirai, Hitoshi; Watanabe, Akira; and Tofukuji, Ikuo, 4,508,443, Cl. 354-402.000.

Watanabe, Eiji: *See*—
Irie, Taisuke; Nakagawa, Yoshitaka; Tatano, Masayoshi; Watanabe, Koichi; and Watanabe, Eiji, 4,508,600, Cl. 204-27.000.

Watanabe, Hiroyuki: *See*—
Todoko, Masaaki; and Watanabe, Hiroyuki, 4,508,877, Cl. 525-333.100.

Watanabe, Kenji, to Katsuji BABA, a part interest. Internal combustion engine of hydrogen gas. 4,508,064, Cl. 123-1.00A.

Watanabe, Koichi: *See*—
Irie, Taisuke; Nakagawa, Yoshitaka; Tatano, Masayoshi; Watanabe, Koichi; and Watanabe, Eiji, 4,508,600, Cl. 204-27.000.

Watanabe, Michio: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,508,481, Cl. 413-1.000.

Watanabe, Ryuzo: *See*—
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, 4,508,680, Cl. 419-5.000.

Watanabe, Shuichi: *See*—
Tanaka, Tsutomu; Yahagi, Mitsuhisa; and Watanabe, Shuichi, 4,508,153, Cl. 152-362.0CS.

Water Services of America, Inc.: *See*—
Baron, Walter J., 4,508,164, Cl. 165-95.000.

Watt, Bryan K.: *See*—
Peyton, John J.; and Watt, Bryan K., 4,509,081, Cl. 358-225.000.

Wauer, John C.: *See*—
Haendel, Richard S.; and Wauer, John C., 4,509,049, Cl. 343-7.500.

Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, to Carl Still GmbH & Co. KG, Firma. Apparatus for dry cooling of coke. 4,508,596, Cl. 202-227.000.

Weber, Klaus; Hujer, Friedrich; and Schaner, Ferdinand, to Agfa-Gevaret Aktiengesellschaft. Container for photographic films and prints. 4,508,224, Cl. 206-455.000.

Webster, Owen W., to Du Pont de Nemours, E. I., and Company. "Living" polymers and process for their preparation. 4,508,880, Cl. 526-190.000.

Weight, John P., to National Research Development Corporation. Resolution transducers, systems and methods for the transmission and/or reception of waves propagated by vibration. 4,509,153, Cl. 367-140.000.

Weinberg, Roger A.; and Glaser, Mark C., to Baker Oil Tools, Inc. Selective casing bore receptacle. 4,508,167, Cl. 166-120.000.

Weinstock, Leonard M.: *See*—
Amato, Joseph S.; Weinstock, Leonard M.; and Karady, Sandor, 4,508,921, Cl. 562-443.000.

Weiss, Gunther; Worz, Paul; and Tomczak, Stanislaus, to Robert Bosch GmbH. Ignition coil construction for engine ignition system. 4,509,033, Cl. 336-107.000.

Weitzel, Stephen D.: *See*—
Dorler, Jack A.; Mosley, Joseph M.; and Weitzel, Stephen D., 4,508,981, Cl. 307-542.000.

Welgos, Robert J.: *See*—
Vanderkooi, Nicholas, Jr.; Stevenson, Philip E.; and Welgos, Robert J., 4,508,769, Cl. 428-36.000.

Weltman, David; and Tsipenyuk, Pyotr, to O.K. Industries Inc. Low profile IC test clip. 4,508,403, Cl. 339-28.000.

Wenzel, Werner: *See*—
Bachmann, Erich; Fabel, Ludwig; Fischer, Roland; Peter, Werner; Scheiter, Bernd; and Wenzel, Werner, 4,508,494, Cl. 418-13.000.

Wenzel, William B. Powered roller skates. 4,508,187, Cl. 180-181.000.

Wermuth, Camille G.: *See*—
Kan, Jean-Paul; Biziere, Kathleen; and Wermuth, Camille G., 4,508,720, Cl. 514-247.000.

Werner, John. Method of sealing and protecting a plastic lined pipe joint. 4,507,842, Cl. 29-451.000.

Werner, Walter M.: *See*—
Cherry, Hitesh; and Werner, Walter M., 4,508,409, Cl. 339-97.00R.

Werth, Dee A.: *See*—
Brush, Robert W., Sr.; and Werth, Dee A., 4,508,406, Cl. 339-89.00M.

Wesson, David S.: *See*—
Skinner, Neal G.; and Wesson, David S., 4,508,174, Cl. 166-373.000.

West, Richard: *See*—
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Weste, Neil H. E.: *See*—
Ackland, Bryan D.; Burr, David J.; and Weste, Neil H. E., 4,509,187, Cl. 381-43.000.

Westinghouse Electric Corp.: *See*—
Fey, Maurice G., 4,509,177, Cl. 373-60.000.
Lambert, James L., 4,508,461, Cl. 374-161 000.
Pavlik, Dennis; and Gronholm, Richard A., 4,508,985, Cl. 310-55.000.

Westvaco Corporation: *See*—
Hawes, David H., 4,508,860, Cl. 524-13.000.

Weyer, Paul P. Rotary actuated support. 4,508,016, Cl. 92-33.000.

Weykam, Gottfried J.: *See*—
Hessling, Heinz W.; and Weykam, Gottfried J., 4,508,483, Cl. 414-127.000.

Whatley, Roger A.: *See*—
Allgood, Robert N.; Peterson, Joe W.; and Whatley, Roger A., 4,508,983, Cl. 307-577.000.

Wheeler, Everett T. Window casement. 4,508,154, Cl. 160-98.000.

White, Frank L. Grease gun extension assembly. 4,508,372, Cl. 285-175.000.

White, Robert N.: *See*—
Muncaster, John W.; Roberts, Michael G.; Rowlett, R. David; Hoitink, Todd B.; Uffner, William E.; and White, Robert N., 4,508,770, Cl. 428-63.000.

White, Russell T., Jr.: *See*—
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White, Wayne D.: *See*—
Busta, Heinz H.; Tsao, Kuey-Yeou; White, Wayne D.; and Loeppert, Peter V., 4,508,613, Cl. 204-418.000.

Whitehead, Howard A., to Kimberly-Clark Corporation. Convolutely wound paper tampon tube. 4,508,531, Cl. 604-14.000.

Whiteside, George D.: *See*—
Costa, Peter F.; and Whiteside, George D., 4,508,440, Cl. 354-187.000.

Whitman, Bruce, to Lear Siegler, Inc. Accessory attachment for conveyors. 4,508,209, Cl. 198-583.000.

Whitten, Glen A.; and Pisarski, Lech. Shadow generating apparatus. 4,508,105, Cl. 128-1.00C.

Whyzmuzis, Paul D.; and Spinks, Anne E., to Henkel Corporation. Polymeric fat acid polyamide resins for use in flexographic ink vehicles having reduced solvent emissions. 4,508,868, Cl. 524-607.000.

Wiart, A.: *See*—
Guedj, F.; Defaucheux, J.; and Wiart, A., 4,508,984, Cl. 310-14.000.

Wico Corporation: *See*—
Peters, Albin; and Fainzilberg, Zeilik, 4,508,343, Cl. 273-119.00A.

Wideman, Lawson G.; and Bente, Lynn A., to Goodyear Tire & Rubber Company, The. Process for the conversion of terpenes to limonene. 4,508,930, Cl. 585-377.000.

Widen, Bo; and Rubensson, Bjorn, to GKN-Stenman AB. Cylinder lock combination, a lock cylinder and a key for such a combination. 4,507,944, Cl. 70-276.000.

Wiegardt, Gordon K.; Hanks, Thomas W.; and Murphy, Kenneth E., to Deere & Company. Vehicle with control system having operator-actuable switch for storing parameter signal value to control vehicle-connected implement raising and lowering structure. 4,508,176, Cl. 172-7.000.

Wieland, Kurt H., to Garrett Corporation, The. Three wheel center fan cooling turbine apparatus and associated methods. 4,507,939, Cl. 62-402.000.

Wiersdorff, Walter-Wielant: *See*—
Mueller, Josef; Wiersdorff, Walter-Wielant; Kirschenlohr, Werner; and Schwantje, Gerd, 4,508,924, Cl. 568-322.000.

Wiggins, John T., to Community Light & Sound Inc. Voice coil centering and suspension for vented pole piece. 4,508,941, Cl. 179-115.5PC.

Wiggins Teape Group Limited, The: *See*—
Shanton, Kenneth J., 4,509,065, Cl. 346-225.000.

Wiggle, Ronald R.: *See*—
Huff, John; Wiggle, Ronald R.; and Hospadaruk, Vladimir, 4,508,684, Cl. 422-8.000.

Wile, Donald T., to National Semiconductor Corporation. AM Radio stop detector. 4,509,204, Cl. 455-169.000.

William L. Bonnell Company, The: *See*—
Kennedy, James A., 4,508,564, Cl. 75-65.00R.

Williams, Bolie C., III: *See*—
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Taylor, William M.; and Williams, Bolie C., III, 4,508,312, Cl. 251-1.00A.

Williams, Charles W.: *See*—
Duncan, David T.; Lipscomb, David M.; McElligott, John; and Williams, Charles W., 4,508,116, Cl. 128-203.280.

Williams, Thomas W.: *See*—
DasGupta, Sumit; Graf, Matthew C.; Rasmussen, Robert A.; and Williams, Thomas W., 4,509,008, Cl. 324-73.00R.

Willmouth, Robert W. Armature lift windmill. 4,508,972, Cl. 290-55.000.

Wilson, David A.: *See*—
Simon, Jaime; Wilson, David A.; and Volkert, Wynn A., 4,508,704, Cl. 424-14.000.

Wilson, H. James, to Safetran Systems Corporation. Impedance bond. 4,509,024, Cl. 333-24.00R.

Wilson, James W.: *See*—
Blackwell, Kim J.; White, Russell T., Jr.; and Wilson, James W., 4,508,612, Cl. 204-298.000.

Wilson, Robert C., Jr.: *See—*
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Wilwerding, Dennis J.; and Adams, James R., Jr., to Honeywell Inc. Detector mismatch correction apparatus. 4,508,963, Cl. 250-201.000.

Windmoller & Holscher: *See—*
Feldkamper, Richard, 4,508,529, Cl. 493-438.000.

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Kan, Frederick S. C.; Li, Kam Wing; and Lau, Kong Ping P., 4,508,958, Cl. 219-369.000.

Winkler, Reinhard: *See—*
Jager, Lothar; Peter, Anton; and Winkler, Reinhard, 4,509,087, Cl. 360-130.210.

Winter, Joseph; and Pryor, Michael J., to Olin Corporation. Method and apparatus for assembling an optical fiber communication cable. 4,508,423, Cl. 350-96.230.

Winyall, Milton E., to W. R. Grace & Co. Particulate dialytic silica. 4,508,607, Cl. 204-180.00P.

Wiser, James G.: *See—*
Thornley, W. Ray; Wiser, James G.; and Lundahl, E. Cordell, 4,507,910, Cl. 56-10.200.

Wiser, Thayne B. Soil pitting and damming implement and process. 4,508,177, Cl. 172-177.000.

Wittmann, Heinz: *See—*
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Wittmann, Joseph W.; and Evans, John M., to CooperVision, Inc. Oxygen permeable hard contact lens. 4,508,884, Cl. 526-279.000.

Wolf, Isaac; and Alper, Yekutiel, to State of Israel, Ministry of Agriculture. Apparatus for harvesting and separation of produce. 4,507,911, Cl. 56-327.00R.

Wolf, Konrad: *See—*
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Wolf, Stephen F.: *See—*
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Wolfe, Edward B. Toothpaste extractor. 4,508,242, Cl. 222-102.000.

Wolff Wire Corporation: *See—*
Minick, Harold N., 4,508,300, Cl. 248-216.100.

Wolfson, Sumner H., to Burr-Brown Corporation. Expendable heater sealing process. 4,507,907, Cl. 53-478.000.

Woltmann, Reinhard; and Sixt, Karl, to Bayerische Motoren Werke Aktiengesellschaft. Mold with feeder channel for the casting of metals, in particular, for low-pressure casting. 4,508,159, Cl. 164-306.000.

Womack, James A.: *See—*
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Wong, Ching-Ping, to AT&T Technologies, Inc. Encapsulated electronic circuit. 4,508,758, Cl. 427-96.000.

Wood, Roy W.: *See—*
Drummond, Donald D.; Johnsey, Walter F.; and Wood, Roy W., 4,508,183, Cl. 175-69.000.

Woodnutt, John P., to Delmatic Limited. Lighting control system. 4,508,997, Cl. 315-360.000.

World, Victor B. Method of obtaining greater lifetime duration from chemiluminescent systems. 4,508,642, Cl. 252-700.000.

Worz, Paul: *See—*
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Wossner, Felix: *See—*
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Wrang, Soren N.: *See—*
Pedersen, Svend P.; Wrang, Soren N.; and Molbaek, Jens J., 4,508,263, Cl. 236-42.000.

Wright, Anthony A. Security battery holder. 4,508,794, Cl. 429-100.000.

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Wright, Fred R., to Wright, Helene R. Bidirectional transition counter with threshold output. 4,509,183, Cl. 377-125.000.

Wright, Helene R.: *See—*
Wright, Fred R., 4,509,183, Cl. 377-125.000.

Wright, Joseph M.: *See—*
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Wucik, Joseph A., Jr.: *See—*
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Wuerzer, Bruno: *See—*
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Wulff, Hermann. Fish processing machine with controlling means for the processing tools. 4,507,823, Cl. 17-55.000.

Wurster, Ewald; and Heidemann, Albert, to Patent Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Halogen cycle incandescent lamp and method for the protection of its inner surface. 4,508,991, Cl. 313-579.000.

Wyatt, Philip W.; Newsome, Allen L., Jr.; Bloom, William G.; Siegel, Bernard; and Lubov, Michael, to American Hospital Supply Corporation. Thermodilution injectate assembly. 4,508,123, Cl. 128-692.000.

Wyrepak Industries, Inc.: *See—*
Bauer, Gordon L., 4,508,290, Cl. 242-128.000.

Xantech Corporation: *See—*
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Xerox Corporation: *See—*
Doery, Michael S., 4,508,447, Cl. 355-14.0SH.
Fischbeck, Kenneth H., 4,509,058, Cl. 346-1.100.
Herloski, Robert P., 4,508,421, Cl. 350-3.710.
Hubler, Lawrence C.; Ferrara, Joseph J.; Albright, Roger N.; and Bassett, Raymond C., 4,508,329, Cl. 270-53.000.
Law, Kock-Yee; and Bailey, Frank C., 4,508,803, Cl. 430-59.000.
May, Joseph N.; and Wing, Joseph M., 4,508,444, Cl. 355-3.00R.
Sohl, Gordon; Ort, Donald L.; and Leicht, John R., 4,509,057, Cl. 346-1.100.
Tokoli, Emery G.; Horgan, Anthony M.; and Carmichael, Kathleen M., 4,508,650, Cl. 260-245.860.

Xidex Corporation: *See—*
Lee, Wai-Hon; and Voisin, Paul H., 4,508,808, Cl. 430-146.000.

XIS, Incorporated: *See—*
Eriksson, Richard C., 4,508,053, Cl. 118-712.000.
Eriksson, Richard C., 4,508,748, Cl. 427-8.000.

Yachida, Yoichi, to Nippon Seiki Kabushiki Kaisha. Device which accurately displays changes in a quantity to be measured. 4,509,044, Cl. 340-789.000.

Yagi, Toshiharu; and Pavlath, Attila E., to United States of America, Agriculture. Fluorination by inorganic fluorides in glow discharge. 4,508,781, Cl. 428-409.000.

Yahagi, Mitsuhisa: *See—*
Tanaka, Tsutomu; Yahagi, Mitsuhisa; and Watanabe, Shuichi, 4,508,153, Cl. 152-362.0CS.

Yale University: *See—*
Pawelek, John M.; and Agin, Patricia P., 4,508,706, Cl. 424-60.000.

Yamabe, Masaaki: *See—*
Ukihashi, Hiroshi; Asawa, Tatsuro; Yamabe, Masaaki; and Miyake, Haruhisa, 4,508,603, Cl. 204-98.000.

Yamada, Mitsuhiko, to Dainippon Screen Mfg. Co., Ltd. Indicating method and apparatus for digitizer menu portions. 4,509,046, Cl. 340-815.100.

Yamada, Seiji: *See—*
Minamida, Kazukiyo; Haze, Setsuo; and Yamada, Seiji, 4,508,185, Cl. 177-1.000.

Yamada, Shinji, to Sharp Kabushiki Kaisha. Auto tuning receiver with a tuning information memory. 4,509,203, Cl. 455-166.000.

Yamada, Yutaka: *See—*
Wada, Hitoshi; Tachikawa, Kyoji; Yamada, Yutaka; and Murase, Satoru, 4,508,578, Cl. 148-11.50F.

Yamagishi, Masahiro: *See—*
Najima, Tetsuo; Tetsuta, Setsuya; Sawata, Yukitaka; and Yamagishi, Masahiro, 4,508,620, Cl. 209-500.000.

Yamaguchi, Tomoyuki: *See—*
Fujii, Tadashi; Yamaguchi, Tomoyuki; Murakami, Kakuji; Kawakami, Tomiko; and Uenozono, Hiroko, 4,508,570, Cl. 106-20.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Kato, Hiromi, 4,508,189, Cl. 180-219.000.

Yamakawa, Hiroyuki: *See—*
Sakuta, Masaharu; Kiya, Soichi; Uchizaki, Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, 4,508,572, Cl. 106-90.000.

Yamamichi, Masayoshi: *See—*
Ohara, Tsunemasa; Suzuki, Masayuki; and Yamamichi, Masayoshi, 4,508,439, Cl. 354-154.000.

Yamamoto, Hachizou: *See—*
Horigome, Koichi; Okada, Seizo; Nishimura, Katsuji; and Yamamoto, Hachizou, 4,509,136, Cl. 364-900.000.

Yamamoto, Kaichi, to Sony Corporation. Signal detecting circuit. 4,509,016, Cl. 328-138.000.

Yamamoto, Sho: *See—*
Tanimura, Nobuyoshi; Yamamoto, Sho; Yoshizaki, Kazuo; and Akima, Isao, 4,509,147, Cl. 365-190.000.

Yamamoto, Shuji: *See—*
Inaike, Toshihiro; Ushimi, Katsuhiko; Yamamoto, Shuji; and Inoue, Toshihiro, 4,508,766, Cl. 427-388.200.

Yamamoto, Teruyuki: *See—*
Miyake, Masayoshi; Ueoka, Isao; Kawaguchi, Munetaka; Nakabayashi, Hirohiko; and Yamamoto, Teruyuki, 4,508,779, Cl. 428-383.000.

Yamamoto, Tsutomu; Ashizawa, Masaaki; Nishimoto, Kazuo; and Sekiguchi, Yuji, to Nichias Corporation. Compressed non-asbestos sheets. 4,508,777, Cl. 428-280.000.

Yamamuro, Kiyohiko; Hirano, Shigeo; Itoh, Isamu; and Iwasa, Yasuo, to Fuji Photo Film Co., Ltd. Method for bleaching color photosensitive material. 4,508,816, Cl. 430-393.000.

Yamasaki, Hitoshi, to Sharp Kabushiki Kaisha. Read format preset in an electronic cash register. 4,508,962, Cl. 235-378.000.

Yamasaki, Saburou: *See—*
Hiraiwa, Kazuyoshi; and Yamasaki, Saburou, 4,507,981, Cl. 74-477.000.

Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, to Ajinomoto Company, Incorporated. Process for producing N-carbobenzoxy-L-aspartic anhydride. 4,508,912, Cl. 549-253.000.

Yamato, Akihiro; and Hashiguchi, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Intake air quantity control method for internal

combustion engines at termination of fuel cut operation. 4,508,074, Cl. 123-327.000.
Yamato, Akihiro; and Koike, Akihiko, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling a fuel metering system of an internal combustion engine. 4,508,084, Cl. 123-492.000.
Yamato, Akihiro, to Honda Motor Co., Ltd. Fuel injection control method for multi cylinder internal combustion engines of sequential injection type at acceleration. 4,508,085, Cl. 123-492.000.
Yamato, Akihiro: *See*—
Hasegawa, Shumpei; and Yamato, Akihiro, 4,508,083, Cl. 123-491.000.
Yan, Tsoung Y., to Mobil Oil Corporation. Visbreaker performance for production of heating oil. 4,508,614, Cl. 208-78.000.
Yanagawa, Hirofumi, to Pioneer Electronic Corporation. Stereo sound system. 4,509,184, Cl. 381-24.000.
Yanagishima, Takayuki: *See*—
Seko, Yasutoshi; Inoue, Masami; and Yanagishima, Takayuki, 4,509,040, Cl. 340-576.000.
Yashima, Michio; Komatsu, Akihiro; Takanashi, Masami; Hirose, Masashi; and Nakayama, Kengo, to Honda Motor Co., Ltd. Handle switch assembly for motorcycles. 4,508,944, Cl. 200-61.850.
Yasuda, Shuhei: *See*—
Takamatsu, Toshiaki; Funada, Fumiaki; Yasuda, Shuhei; and Matsuura, Masataka, 4,509,099, Cl. 361-413.000.
Yasuhara, Yutaka; Nishino, Masaki; and Matsuhisa, Seikichi, to Toray Industries, Inc. Method of producing cyclohexane derivatives directly from aromatic hydrocarbons. 4,508,918, Cl. 560-241.000.
Yasumuro, Hisakazu: *See*—
Ishibashi, Kazuhisa; Kurashima, Hideo; Yasumuro, Hisakazu; Watanabe, Michio; Imatani, Tsuneo; Taira, Kazuo; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,508,481, Cl. 413-1.000.
Yasuoka, Akimasa; and Otobe, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling fuel supply to an internal combustion engine after termination of fuel cut. 4,508,087, Cl. 123-493.000.
Yatsunami, Kenrow; and Iwamoto, Yoshihiki, to Sharp Kabushiki Kaisha. Electronic calculating machine with facilities of announcing data introduced. 4,509,129, Cl. 364-513.500.
Yatsuyanagi, Nobuyuki: *See*—
Niino, Masayuki; Yatsuyanagi, Nobuyuki; Kumakawa, Akinaga; Suzuki, Akio; Gomi, Hiromi; Sakamoto, Hiroshi; Sasaki, Masaki; Masuda, Yoshimichi; Watanabe, Ryuzo; Takekawa, Junjiro; Ohtsuki, Etsuo; and Isago, Terashi, 4,508,680, Cl. 419-5.000.
Yelderman, Mark L., to Leland Stanford Jr. University, The Board of Trustees of the. Method and apparatus for measuring flow. 4,507,974, Cl. 73-861.060.
Yokogawa Hokushin Electric Corporation: *See*—
Morita, Saichiro, 4,507,972, Cl. 73-708.000.
Yokoi, Gunpei, to Nintendo Co., Ltd. Game device. 4,508,336, Cl. 273-1.00L.
Yokooku, Katsuhiko: *See*—
Oda, Tatsuro; Tanaka, Hideki; Yoshioka, Sadashichi; and Yokooku, Katsuhiko, 4,508,076, Cl. 123-339.000.
Takeuchi, Nobuo; Kaneko, Tadashi; Nakazumi, Tadataka; and Yokooku, Katsuhiko, 4,508,078, Cl. 123-399.000.
Yokota, Masami: *See*—
Sugitani, Hiroshi; Inamoto, Tadayoshi; and Yokota, Masami, 4,509,063, Cl. 346-140.00R.
Yokota, Yoshiharu: *See*—
Doi, Motomichi; Okano, Kinpei; Nii, Katsutoshi; and Yokota, Yoshiharu, 4,508,396, Cl. 384-463.000.
Yoneda, Naoto; Kato, Jyoji; Hayashi, Kimiaki; Ochiai, Takashi; and Kinashi, Keizo, to Tanabe Seiyaku Co., Ltd. Antihypertensive 2-oxoimidazolidine derivatives. 4,508,727, Cl. 514-398.000.
Yong, Raymond N.; and Sethi, Amar J., to Suncor, Inc. Process for making starch flocculants of improved efficiency. 4,508,627, Cl. 210-728.000.
Yoshida, Hajime, to Hajime Industries Ltd. Defect inspection apparatus. 4,509,076, Cl. 358-106.000.
Yoshida, Kunio, to Sharp Kabushiki Kaisha. Language translator with random generation of test words during learning mode. 4,509,137, Cl. 364-900.000.
Yoshida, Robert A., to Syva Company. Compositions for competitive protein binding assays inhibiting non-specific interference. 4,508,892, Cl. 536-51.000.
Yoshida, Ryo: *See*—
Nakayama, Koji; Yoshida, Ryo; and Matsumoto, Hiroshi, 4,508,562, Cl. 71-94.000.
Yoshida, Shohei; and Vogl, Otto, to Asahi Glass Company Ltd. Benzotriazole compound and homopolymer or copolymers thereof. 4,508,882, Cl. 526-259.000.
Yoshida, Susumu: *See*—
Yuki, Katsumi; Yoshida, Susumu; Ozeki, Mineo; Miyazaki, Yasuyuki; and Kawamata, Masaru, 4,509,127, Cl. 364-478.000.
Yoshida, Tomio: *See*—
Ohara, Shunji; Yoshida, Tomio; Satoh, Isao; and Koishi, Kenji, 4,509,156, Cl. 369-54.000.
Yoshida, Yoshimitsu: *See*—
Nakato, Hakaru; Sakuraya, Toshikazu; Habu, Yasuhiro; Emi, Toshihiko; Kodama, Masanori; Koshikawa, Takao; Yoshida, Yoshimitsu; and Shimokawa, Fumitaka, 4,508,571, Cl. 106-38.280.
Yoshida, Yuji: *See*—
Hokamura, Sadakazu; Shinohara, Toshio; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,508,767, Cl. 427-407.100.
Yoshimura, Hirofumi; and Ikeda, Nobuo, to Matsushita Electric Industrial Co., Ltd. Microwave oven with rotary antenna. 4,508,946, Cl. 219-10.55F.
Yoshino, Atsuhiko: *See*—
Matsuo, Yoshiho; Yoshino, Atsuhiko; and Nishijima, Ryoji, 4,508,878, Cl. 525-333.800.
Yoshino, Hozo, to System Homes Company Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Integral solar and heat pump water heating system. 4,507,936, Cl. 62-235.100.
Yoshioka, Sadashichi: *See*—
Oda, Tatsuro; Tanaka, Hideki; Yoshioka, Sadashichi; and Yokooku, Katsuhiko, 4,508,076, Cl. 123-339.000.
Yoshioka, Takeo: *See*—
Kubo, Katsuro; Yoshioka, Takeo; Okabe, Mitsuyasu; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,508,648, Cl. 260-245.20T.
Yoshioka, Yasuhiko: *See*—
Sakuta, Masaharu; Kiya, Soichi; Uchizaki, Iwao; Yoshioka, Yasuhiko; Ito, Koichi; Kaya, Tadahiro; Shioya, Tsunetoshi; Shimoyama, Yoshifumi; and Yamakawa, Hiroyuki, 4,508,572, Cl. 106-90.000.
Yoshizaki, Kazuo: *See*—
Tanimura, Nobuyoshi; Yamamoto, Sho; Yoshizaki, Kazuo; and Akima, Isao, 4,509,147, Cl. 365-190.000.
Yost, William G., Jr. Ski rack. 4,508,229, Cl. 211-70.500.
Younes, Usama E., to Atlantic Richfield Company. Alternating copolymer of brominated styrene and N-brominated phenyl maleimide. 4,508,883, Cl. 526-262.000.
Young, Donald C., to Union Oil Company of California. Compositions containing urea, ammonia, and water. 4,508,558, Cl. 71-30.000.
Yuasa, Hiroyoshi: *See*—
Omura, Koichi; and Yuasa, Hiroyoshi, 4,509,186, Cl. 381-43.000.
Yuen, Henry K.: *See*—
Carter, Don E.; and Yuen, Henry K., 4,508,101, Cl. 126-436.000.
Yuki, Katsumi; Yoshida, Susumu; Ozeki, Mineo; Miyazaki, Yasuyuki; and Kawamata, Masaru, to Kabushiki Kaisha Toyoda Jidoh Shokki Seisakusho. Control device for loading and unloading mechanism. 4,509,127, Cl. 364-478.000.
Zabielski, Kenneth D.: *See*—
Garver, Edward B., Sr.; and Zabielski, Kenneth D., 4,508,534, Cl. 604-111.000.
Zacconi, Anthony N.: *See*—
Manton, John C.; Okin, Kenneth; and Zacconi, Anthony N., 4,509,115, Cl. 364-200.000.
Zamory, William: *See*—
Lerman, Michael J.; Koehl, Richard; Chiarella, Anthony A.; and Zamory, William, 4,508,455, Cl. 366-247.000.
Zandona, Oliver J.; Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., to Ashland Oil, Inc. Catalyst for the conversion of carbo-metallic containing oils. 4,508,839, Cl. 502-65.000.
Zanella, Francesco: *See*—
Rossin, Ineo; and Zanella, Francesco, 4,508,308, Cl. 249-19.000.
Zarini, Franco: *See*—
Alpegiani, Marco; Battistini, Carlo; Bedeschi, Angelo; Franceschi, Giovanni; Foglio, Maurizio; and Zarini, Franco, 4,508,649, Cl. 260-245.20R.
Zebrowski, Tadeusz, to U.S. Philips Corporation. Arrangement for rotating the shaft of an electrical component. 4,507,979, Cl. 74-89.220.
Zeldes, Michael D., to Du Pont de Nemours, E. I., and Company. Coating process employs surfactants. 4,508,764, Cl. 427-296.000.
Zeller, Rolf: *See*—
Dobler, Helmut; Zeller, Rolf; and Seitz, Helmut, 4,508,069, Cl. 123-192.00B.
Zellerman, Gabor, deceased: *See*—
Oreopoulos, Dimitrios G.; Zellerman, Gabor, deceased; and Price, Robert G., administrator, 4,508,367, Cl. 285-3.000.
Zenith Electronics Corporation: *See*—
Tong, Francis F.; and Vaughter, Harmon P., 4,509,207, Cl. 455-251.000.
Zeugner, Horst: *See*—
Liepmann, Hans; Ruhland, Michael; Muesch, Herbert; Benson, Werner; Heinemann, Henning; and Zeugner, Horst, 4,508,716, Cl. 514-220.000.
Ziegler, Erich. Aromatic citrus oil concentrate which is stable in storage. 4,508,747, Cl. 426-651.000.
Ziegler, Joseph L.: *See*—
Freewalt, Wayne L.; and Ziegler, Joseph L., 4,508,194, Cl. 182-153.000.
Zielke, Terry L.: *See*—
Davis, John E.; Zielke, Terry L.; and Coash, Ronald J., 4,508,269, Cl. 239-177.200.
Zimmerman, Franz X., to Autoclave Engineers, Inc. Vacuum sintering and hot isostatic pressing in the same vessel. 4,509,179, Cl. 373-109.000.
Zimmerman, William B.: *See*—
Bennett, Terry A.; Claassen, George R.; and Zimmerman, William B., 4,508,556, Cl. 65-25.400.
Zlokarnik, Marko, to Bayer Aktiengesellschaft. Mechanical foam breakers and a process for mechanical foam-breaking. 4,508,546, Cl. 55-87.000.
Zoecon Corporation: *See*—
Bamberg, Joe T.; and Kohn, Gustave K., 4,508,906, Cl. 546-300.000.
Zollner, Dieter: *See*—
Lades, Hans; Fink, Friedrich; Liebel, Siegfried; Lauterbach, Inge; Taube, Thomas; and Zollner, Dieter, 4,509,178, Cl. 373-93.000.
Zones, Stacey I., to Chevron Research Company. Zeolite SSZ-16. 4,508,837, Cl. 502-62.000.
Zuckler, Karl, to Siemens Aktiengesellschaft. Vacuum switching interrupter with annular member and diametrical contact web. 4,508,945, Cl. 200-144.00B.
Zukotynski, Stefan, to Innovations Foundation of the University of Toronto, The. Silicon-based solar energy conversion cells. 4,508,932, Cl. 136-258.000.
Zyki, Leonard C., Jr. Patient lift. 4,507,814, Cl. 5-84.000.
501 Lamipak Industries (Europe) Ltd.: *See*—
Choe, Francis S. O., 4,508,222, Cl. 206-390.000.
501 Polymer-Physik GmbH & Co.: *See*—
Foll, Eberhard; Holl, Peter; and Vetter, Helmut, 4,508,750, Cl. 427-44.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF APRIL, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aldridge, R. Warren, Jr., to Spencer Wright Industries, Inc. Align boring machine. Re. 31,859, Cl. 408-54.000.

Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., to Sperry Corporation. Harvesting machines. Re. 31,860, Cl. 130-27.00P.

Diver, James J.: *See*—
Euverard, Maynard R.; Heide, Henry A.; and Diver, James J., Re. 31,858, Cl. 414-37.000.

Euverard, Maynard R.; Heide, Henry A.; and Diver, James J., to Velten & Pulver, Inc. Continuous chain stacker/unstacker. Re. 31,858, Cl. 414-37.000.

Heide, Henry A.: *See*—
Euverard, Maynard R.; Heide, Henry A.; and Diver, James J., Re. 31,858, Cl. 414-37.000.

Holly, Harry H., to Holly Systems, Inc. Method for making food patty. Re. 31,857, Cl. 17-45.000.

Holly Systems, Inc.: *See*—
Holly, Harry H., Re. 31,857, Cl. 17-45.000.

Muijs, Cornelis G. M.: *See*—
Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., Re. 31,860, Cl. 130-27.00P.

Spencer Wright Industries, Inc.: *See*—
Aldridge, R. Warren, Jr., Re. 31,859, Cl. 408-54.000.

Sperry Corporation: *See*—
Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., Re. 31,860, Cl. 130-27.00P.

Velten & Pulver, Inc.: *See*—
Euverard, Maynard R.; Heide, Henry A.; and Diver, James J., Re. 31,858, Cl. 414-37.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Adams, Robert M. Vehicle cover assembly. B1 4,272,119, 4-2-85, Cl. 296-100.000.

American Cyanamid Company: *See*—
Spatz, David M.; and Cross, Barrington, B1 4,289,903, Cl. 564-20.000.

Benson, Clark K.: *See*—
Caridis, Andrew A.; and Benson, Clark K., B1 4,167,585, Cl. 426-233.000.

Brad Ragan Inc.: *See*—
Ragan, Bradley E., B1 3,472,714, Cl. 156-96.000.

Caridis, Andrew A.; and Benson, Clark K., to Heat and Control, Inc. Method for heating and cooking foods in a closed treatment chamber by maintaining the temperature and moisture content. B1 4,167,585, 4-2-85, Cl. 426-233.000.

Cross, Barrington: *See*—
Spatz, David M.; and Cross, Barrington, B1 4,289,903, Cl. 564-20.000.

DeFreitas, Richard E., to DeltaLab Research, Inc. Digital encoding circuitry. B1 4,190,801, 4-2-85, Cl. 375-30.000.

DeltaLab Research, Inc.: *See*—
DeFreitas, Richard E., B1 4,190,801, Cl. 375-30.000.

Gonzalez, Georges: *See*—
Quillery, Henri P. M.; and Gonzalez, Georges, B1 3,523,464, Cl. 74-552.000.

Heat and Control, Inc.: *See*—
Caridis, Andrew A.; and Benson, Clark K., B1 4,167,585, Cl. 426-233.000.

Medtronic, Inc.: *See*—
Stokes, Kenneth B., B1 4,313,448, Cl. 128-785.000.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Yamaguchi, Takaaki, B1 4,357,256, Cl. 252-188.240.

Quillery, Henri P. M.; and Gonzalez, Georges, to Societe Quillery. Steering wheel with plastic foam sheathing. B1 3,523,464, 4-2-85, Cl. 74-552.000.

Ragan, Bradley E., to Brad Ragan Inc. Method of rebuilding previously used tires. B1 3,472,714, 4-2-85, Cl. 156-96.000.

Societe Quillery: *See*—
Quillery, Henri P. M.; and Gonzalez, Georges, B1 3,523,464, Cl. 74-552.000.

Spatz, David M.; and Cross, Barrington, to American Cyanamid Company. Para-phenylalkoxy phenylurea and thiourea compounds and herbicidal use thereof. B1 4,289,903, 4-2-85, Cl. 564-20.000.

Stokes, Kenneth B., to Medtronic, Inc. Myocardial sutureless lead. B1 4,313,448, 4-2-85, Cl. 128-785.000.

Yamaguchi, Takaaki, to Mitsubishi Gas Chemical Company, Inc. Sodium hydrosulfite composition. B1 4,357,256, 4-2-85, Cl. 252-188.240.

LIST OF DESIGN PATENTEES

Albanese, Anthony F.; Chalfin, Samuel; and Chalfin, Lawrence M., to I.P.F. International, Inc. Chair. 278,192, 4-2-85, Cl. D6-379.000.

Amerace Corporation: *See*—
Kominiak, Andrew A.; and Luzzi, Glenn J., 278,230, Cl. D13-24.000.

American Standard Inc.: *See*—
Niemann, James E., 278,270, Cl. D23-32.000.
Niemann, James E., 278,271, Cl. D23-32.000.

Arai, Noriyuki: *See*—
Kurokawa, Koya; and Arai, Noriyuki, 278,238, Cl. D14-78.000.

Bakic, Dieter. Cosmetic case. 278,276, 4-2-85, Cl. D28-78.000.

Bell Helicopter Textron Inc.: *See*—
Johnston, George W., Jr., 278,227, Cl. D12-327.000.

Bergman, Nils-Ake: *See*—
Widell, Jan; Widell, Harald; and Bergman, Nils-Ake, 278,229, Cl. D13-12.000.

Bingham, George H.: *See*—
Rosensweig, Burton J.; Bingham, George H.; and Krupotich, Edward A., 278,250, Cl. D18-22.000.

Black & Decker Inc.: *See*—
McCloskey, Don R., 278,278, Cl. D32-18.000.

Boetger, Ronald L., to Code Manufacturing, Inc. Tire inflator. 278,244, 4-2-85, Cl. D15-7.000.

Boxall, Stanley S. Display case. 278,193, 4-2-85, Cl. D6-471.000.

Braukmann, Heinz W. Bottle cap opener. 278,203, 4-2-85, Cl. D8-40.000.

Bridgestone Tire Company, Limited: *See*—
Kojima, Hiroshi; and Tsuda, Tooru, 278,221, Cl. D12-147.000.
Kojima, Hiroshi; and Koyasu, Tosihiro, 278,222, Cl. D12-147.000.
Kojima, Hiroshi; and Sakamaki, Yuji, 278,223, Cl. D12-147.000.
Motomura, Kenichi; and Tokunaga, Seiichiro, 278,218, Cl. D12-142.000.

Nakamura, Masao; Kojima, Hiroshi; and Nishio, Hideaki, 278,224, Cl. D12-151.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,248, Cl. D18-1.000.
Brown, Michael; Read, Clifford D.; and Ellis, Warren K., to Northern Telecom Limited. Telephone set base. 278,236, 4-2-85, Cl. D14-60.000.
Burdick, Laura M. Combined shipping, storage and packaging container. 278,206, 4-2-85, Cl. D9-327.000.
Burns, Michael D. Cigarette pack holder. 278,188, 4-2-85, Cl. D2-400.000.
Cable Electric Products, Inc.: *See*—
Schwartz, Frederic W., 278,212, Cl. D10-77.000.
Canon Kabushiki Kaisha: *See*—
Masaki, Nobuo, 278,246, Cl. D16-31.000.
Cassai, Gino H.: *See*—
Cassai, Henry J.; and Cassai, Gino H., 278,208, Cl. D9-352.000.
Cassai, Henry J.; and Cassai, Gino H. Bottle. 278,208, 4-2-85, Cl. D9-352.000.
Chalfin, Lawrence M.: *See*—
Albanese, Anthony F.; Chalfin, Samuel; and Chalfin, Lawrence M., 278,192, Cl. D6-379.000.
Chalfin, Samuel: *See*—
Albanese, Anthony F.; Chalfin, Samuel; and Chalfin, Lawrence M., 278,192, Cl. D6-379.000.
Chaussures Mephisto S.A.: *See*—
Michaeli, Martin, 278,185, Cl. D2-314.000.
Michaeli, Martin, 278,186, Cl. D2-314.000.
Chung Mei Metal and Plastic Factory: *See*—
Mann, Kittson, 278,275, Cl. D26-42.000.
Code Manufacturing, Inc.: *See*—
Boetger, Ronald L., 278,244, Cl. D15-7.000.
Continental Scale Corporation: *See*—
Kushmuk, Walter P., 278,213, Cl. D10-92.000.
CPG Products Corp.: *See*—
Lockhart, Pamela J., 278,256, Cl. D21-104.000.
Cross, Lance D., to Heel Shield, Inc. Boot heel protective shield. 278,184, 4-2-85, Cl. D2-277.000.
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151 4,507,903
203 4,507,904
262 4,507,905
371 4,507,906
478 4,507,907
498 4,507,908

CLASS 55

53 4,508,545
87 4,508,546
101 4,508,547
158 4,508,548
165 4,508,549
216 4,508,550
263 4,508,551
440 4,508,552

CLASS 56

9 4,507,909
10.2 4,507,910
327 R 4,507,911

CLASS 57

22 4,507,912
328 4,507,913

CLASS 60

39.17 4,507,914
39.281 4,507,915
323 4,507,917
370 4,507,918
404 4,507,919
443 4,507,920
527 4,507,921
531 4,507,922
583 4,507,923
595 4,507,924
641.1 4,507,916
641.4 4,507,925
656 4,507,926

CLASS 62

3 4,507,927
4,507,928
79 4,507,929
129 4,507,930
175 4,507,931
180 4,507,932
184 4,507,933
210 4,507,934
227 4,507,935
235.1 4,507,936
298 4,507,937
324.1 4,507,938
402 4,507,939
407 4,507,940
514 R 4,507,941
541 4,508,553

CLASS 65

3.1 4,508,554
3.43 4,508,555
25.4 4,508,556
348 4,508,557

CLASS 68

20 4,507,942

CLASS 69

41 4,507,943

CLASS 70

276 4,507,944
363 4,507,945

CLASS 71

30 4,508,558
83 4,508,559
94 4,508,560
4,508,561
4,508,562

CLASS 72

17 4,507,946
130 4,507,947
185 4,507,948
201 4,507,949
257 4,507,950
431 4,507,951

CLASS 73

3 4,507,952
7 4,507,953
40.7 4,507,954
61.4 4,507,955
146.5 4,507,956
151 4,507,957
4,507,958
182 4,507,959
187 4,507,960
317 4,507,961
384 4,507,962
431 4,507,963
462 4,507,964
517 B 4,507,965
603 4,507,966
621 4,507,967
626 4,507,968
644 4,507,969
702 4,507,970
707 4,507,971
708 4,507,972
724 4,507,973
861.06 4,507,974
861.12 4,507,975
861.54 4,507,976
864.12 4,507,977

CLASS 74

7 E 4,507,978
89.22 4,507,979
473 R 4,507,980
477 4,507,981
493 4,507,982
552 B1 3,523,464
572 4,507,983
650 4,507,984
866 4,507,985
4,507,986

CLASS 75

0.5 BB 4,508,563
65 R 4,508,564
77 4,508,565
88 4,508,566
231 4,508,567

CLASS 81

3.09 4,507,988
57.39 4,507,989
4,507,990
177 G 4,508,005
463 4,507,991
485 4,507,987

CLASS 82

2.7 4,507,992
36 A 4,507,993

CLASS 83

58 4,507,994
153 4,507,995
344 4,507,996
368 4,507,997
419 4,507,998
665 4,507,999

CLASS 84

1.01 4,508,000
4,508,001
1.03 4,508,002
293 4,508,003
385 P 4,508,004

CLASS 89

24 4,508,006
37.11 4,508,007

CLASS 91

372 4,508,008
376 R 4,508,009
474 4,508,010
506 4,508,011
512 4,508,012
516 4,508,013
527 4,508,014

CLASS 92

2 4,508,015
33 4,508,016
85 B 4,508,017
128 4,508,018
158 4,508,019
168 4,508,020

CLASS 98

2.01 4,508,021
40.12 4,508,022

CLASS 99

279 4,508,023
340 4,508,024
353 4,508,025
407 4,508,026
416 4,508,027
421 V 4,508,028
516 4,508,029

CLASS 100

26 4,508,030

CLASS 101

41 4,508,031
163 4,508,032
217 4,508,033
365 4,508,034

CLASS 102

313 4,508,035
444 4,508,036

CLASS 105

290 4,508,037

CLASS 106

2 4,508,568
14.12 4,508,569
20 4,508,570
38.28 4,508,571
90 4,508,572
100 4,508,573
109 4,508,574
148 4,508,575
213 4,508,576

CLASS 108

135 4,508,038

CLASS 110

258 4,508,039
347 4,508,040
4,508,041

CLASS 112

226 4,508,042
235 4,508,043
262.2 4,508,044

CLASS 114

39 4,508,045
4,508,046
355 4,508,047

CLASS 116

291 4,508,048

CLASS 118

50.1 4,508,049
118 4,508,050
410 4,508,051
651 4,508,052
712 4,508,053
718 4,508,054
724 4,508,055
730 4,508,056

CLASS 119

3 4,508,057
14.02 4,508,058
14.03 4,508,059
16 4,508,060
51 R 4,508,061
82 4,508,062

CLASS 122

504 4,508,063

CLASS 123

1 A 4,508,064
41.35 4,508,065
41.71 4,508,066
90.49 4,508,067
187.5 R 4,508,068
192 B 4,508,069
193 CP 4,508,070
195 C 4,508,072
198 A 4,508,071
307 4,508,073
327 4,508,074
339 4,508,075
4,508,076
357 4,508,077
399 4,508,078
425 4,508,079
449 4,508,080
450 4,508,081
478 4,508,082
491 4,508,083
492 4,508,084
4,508,085
4,508,086
493 4,508,087
4,508,088
559 4,508,089
564 4,508,090
586 4,508,091
617 4,508,092

CLASS 124

1 4,508,093

CLASS 126

9 R 4,508,094
4,508,095
4,508,096
41 R 4,508,097
139 4,508,098
390 4,508,100
400 4,508,099
436 4,508,101
437 4,508,102
443 4,508,104

CLASS 128

1 C 4,508,105
1 R 4,508,106
54 4,508,107
65 4,508,108
75 4,508,109
78 4,508,110
87 R 4,508,111
89 R 4,508,112
132 D 4,508,113
138 R 4,508,114
201.23 4,508,115
203.28 4,508,116
204.21 4,508,117
204.26 4,508,118
329 A 4,508,119
372 4,508,120
639 4,508,121
660 4,508,122
673 4,508,103
692 4,508,123
785 B1 4,313,448

CLASS 130

27 P Re.31,860

CLASS 132

41 R 4,508,124
92 R 4,508,125

CLASS 134

1 4,508,577

CLASS 135

89 4,508,126

CLASS 136

255 4,508,931
258 4,508,932

CLASS 137

8 4,508,127
13 4,508,128
15 4,508,129
4,508,130
43 4,508,131
62 4,508,132
68 R 4,508,133
103 4,508,134
185 4,508,135
218 4,508,136
4,508,137
239 4,508,138
315 4,508,139
501 4,508,140
560 4,508,141
625.4 4,508,142
636.1 4,508,143

CLASS 138

45 4,508,144

CLASS 139

92 4,508,145
196.2 4,508,146

CLASS 141

1.1 4,508,147
147 4,508,148

CLASS 144

245 A 4,508,149

CLASS 148

11.5 F 4,508,578
175 4,508,579

CLASS 149

19.91 4,508,580

CLASS 152

169 4,508,150
213 A 4,508,151
356 R 4,508,152
362 CS 4,508,153

CLASS 156

73.1 4,508,581
93 4,508,582
94 4,508,583
96 B1 3,472,714
353 4,508,584
393 4,508,585
401 4,508,586
527 4,508,587
584 4,508,588
4,508,589
601 4,508,590
659.1 4,508,591

CLASS 159

2.1 4,508,592

CLASS 160

98 4,508,154

CLASS 162

29 4,508,593
135 4,508,594
158 4,508,595

CLASS 164

35 4,508,155
4,508,156
63 4,508,157
110 4,508,158
306 4,508,159
467 4,508,160

CLASS 165

1 4,508,161
56 4,508,162
80 B 4,508,163
95 4,508,164

CLASS 166

117.5 4,508,165
4,508,166
120 4,508,167
248 4,508,168
250 4,508,169
272 4,508,170
273 4,508,171
303 4,508,172
330 4,508,173
373 4,508,174

CLASS 169

38 4,508,175

CLASS 172

7 4,508,176
49.5 4,508,179
177 4,508,177
239 4,508,178

CLASS 173

104 4,508,180

CLASS 174

67 4,508,933
101.5 4,508,934

CLASS 175

19 4,508,181
61 4,508,182
69 4,508,183
346 4,508,184

CLASS 177

1 4,508,185
4,508,186

CLASS 179

2 EA 4,508,935
82 4,508,936
84 T 4,508,937
90 B 4,508,939
90 BD 4,508,938
107 FD 4,508,940
115.5 PC 4,508,941

CLASS 180

181 4,508,187
210 4,508,188
219 4,508,189
247 4,508,190

CLASS 181

107 4,508,191
158 4,508,192

CLASS 182

5 4,508,193
153 4,508,194

CLASS 184

1.5 4,508,195

CLASS 188

1.11 4,508,196
47 4,508,197
71.4 4,508,198
250 B 4,508,199
264 P 4,508,200
322.19 4,508,201

CLASS 190

115 4,508,202

CLASS 192

84 C 4,508,203

CLASS 193

40 4,508,204

CLASS 198

334 4,508,205
365 4,508,206
478 4,508,207
583 4,508,209
627 4,508,210
750 4,508,211
751 4,508,208
781 4,508,212
813 4,508,213
833 4,508,214

CLASS 200

5 A 4,508,942
17 R 4,508,943
61.85 4,508,944
144 B 4,508,945

CLASS 202

227 4,508,596

CLASS 203

79 4,508,597

CLASS 204

1 T 4,508,598
10 4,508,599
27 4,508,600
38.5 4,508,601
95 4,508,602
98 4,508,603
129.5 4,508,604
158 R 4,508,605
169 4,508,606
180 P 4,508,607
192 C 4,508,608
192 P 4,508,610
192 S 4,508,609
202 4,508,611
298 4,508,612
418 4,508,613

CLASS 206

3 4,508,215
5.1 4,508,216
45.18 4,508,217
271 4,508,218
319 4,508,219
343 4,508,220
379 4,508,221
390 4,508,222
423 4,508,223
455 4,508,224
461 4,508,225
620 4,508,226

CLASS 208

78 4,508,614
89 4,508,615
111 4,508,616
134 4,508,617
4,508,618
455 4,508,305

CLASS 209

169 4,508,619
500 4,508,620
927 4,508,227

CLASS 210

86 4,508,621
96.2 4,508,622
658 4,508,624
695 4,508,625
708 4,508,626
728 4,508,627

CLASS 211

41 4,508,228
70.5 4,508,229
181 4,508,230
199 4,508,231

CLASS 212

178 4,508,232
182 4,508,233

CLASS 215

206 4,508,234
307 4,508,235
308 4,508,236

CLASS 219

10.55 B 4,508,947
10.55 F 4,508,946
10.55 M 4,508,948
61.2 4,508,949
69 D 4,508,950
74 4,508,951
121 EH 4,508,952
125.1 4,508,953
132 4,508,954
146.21 4,508,955
215 4,508,956
305 4,508,957
369 4,508,958
385 4,508,959
388 4,508,960
449 4,508,961

CLASS 220

6 4,508,237
229 4,508,623

CLASS 221

107 4,508,238

CLASS 222

39 4,508,239
96 4,508,240
102 4,508,242
142 4,508,243
153 4,508,244
327 4,508,245
477 4,508,246
598 4,508,247
600 4,508,241
623 4,508,248

CLASS 224

219 4,508,249

CLASS 225

97 4,508,250

CLASS 226

25 4,508,251
44 4,508,252

CLASS 227

19 4,508,253
116 4,508,254

CLASS 228

5.1 4,508,255
152 4,508,256
263.13 4,508,257

CLASS 229

38 4,508,258

CLASS 232

17 4,508,259
43.1 4,508,260

CLASS 235

378 4,508,962

CLASS 236

20 R 4,508,261
42 4,508,262
4,508,263

CLASS 237

12.3 B 4,508,264

CLASS 239

3 4,508,265
4,508,266
11 4,508,267
119 4,508,268
177.2 4,508,269
265.35 4,508,270
305 4,508,271
318 4,508,272
427 4,508,273
455 4,508,274
533.3 4,508,275
691 4,508,276

CLASS 241

65 4,508,277

CLASS 242

1 4,508,278
54 R 4,508,281
56 R 4,508,279
56.2 4,508,282
56.4 4,508,283
75.51 4,508,284
99 4,508,285
107 4,508,286
4,508,287
4,508,288
107.4 B 4,508,289
128 4,508,290
156.2 4,508,291
190 4,508,292
191 4,508,280

CLASS 244

3.15 4,508,293
122 AG 4,508,294
134 A 4,508,295
158 R 4,508,296
173 4,508,297

CLASS 246

167 R 4,508,298

CLASS 248

216.1 4,508,300
250 4,508,301
297.3 4,508,302
311.2 4,508,303
4,508,304
454 4,508,306
460 4,508,307

CLASS 249

19 4,508,308
81 4,508,309
189 4,508,310

CLASS 250

201 4,508,963
4,508,964
231 SE 4,508,965
327.2 4,508,966
396 R 4,508,967
441.1 4,508,968
506.1 4,508,969
577 4,508,970

CLASS 251

1 A 4,508,312
4,508,313
1 B 4,508,311
11 4,508,314
173 4,508,315

CLASS 252

8.5 P 4,508,628
8.55 D 4,508,629
32.5 4,508,630
68 4,508,631
70 4,508,632
135 4,508,633
163 4,508,634
174.23 4,508,635
188.24 B1 4,357,256
301.21 4,508,784
301.36 4,508,636
396 4,508,637
401 4,508,638
500 4,508,639
503 4,508,640
626 4,508,641
700 4,508,642

CLASS 254

4 R 4,508,316
134.3 FT 4,508,317
350 4,508,318

CLASS 256

19 4,508,319
47 4,508,320
65 4,508,321

CLASS 260

112 B 4,508,643
112.5 R 4,508,644
4,508,645
239.3 R 4,508,646
239.3 T 4,508,647
245.2 R 4,508,649
245.2 T 4,508,648
245.86 4,508,650
397.2 4,508,651
407 4,508,652
410.5 4,508,653
429 R 4,508,654
4,508,655
463 4,508,656
4,508,657
465 D 4,508,658
4,508,659
465.4 4,508,660
544 D 4,508,661
4,508,857
550 4,508,662
968 4,508,663

CLASS 261

44 C 4,508,664
93 4,508,665

CLASS 264

12 4,508,666
13 4,508,667
22 4,508,668
36 4,508,669
40.6 4,508,670
58 4,508,671
78 4,508,672
120 4,508,673
234 4,508,674
310 4,508,675
328.8 4,508,676

CLASS 266

149 4,508,322
191 4,508,323
236 4,508,324

CLASS 267

47 4,508,325

CLASS 269

22 4,508,326
23 4,508,327
236 4,508,328

CLASS 270

53 4,508,329

CLASS 271

33 4,508,330
107 4,508,331
118 4,508,332
218 4,508,333
308 4,508,334

CLASS 272

145 4,508,335

CLASS 273

1 L 4,508,336
1.5 R 4,508,337
9 4,508,338
26 E 4,508,339
4,508,340
55 R 4,508,341
80 C 4,508,342
119 A 4,508,343
141 R 4,508,344
143 R 4,508,345
144 B 4,508,346
157 R 4,508,347
4,508,348
175 4,508,349
183 D 4,508,350
248 4,508,351
274 4,508,352
313 4,508,353

CLASS 277

27 4,508,354
189 4,508,355
205 4,508,356

CLASS 279

1 C 4,508,357

CLASS 280

234 4,508,358
463 4,508,359
605 4,508,360
628 4,508,361
804 4,508,362
808 4,508,363
821 4,508,364

CLASS 281

2 4,508,365
36 4,508,366

CLASS 285

3 4,508,367
21 4,508,368
39 4,508,369
53 4,508,370
121 4,508,371
175 4,508,372
226 4,508,373
319 4,508,374
334 4,508,375
363 4,508,376

CLASS 290

1 R 4,508,971
5 S 4,508,973
55 4,508,972

CLASS 292

166 4,508,377
333 4,508,378
336.3 4,508,379

CLASS 296

1 S 4,508,380
70 4,508,381
100 B1 4,272,119
213 4,508,382

CLASS 297

284 4,508,383
4,508,384
341 4,508,385
346 4,508,386
429 4,508,387

CLASS 298

22 C 4,508,388

CLASS 299

17 4,508,389
35 4,508,390
43 4,508,391

CLASS 301

63 PW 4,508,392

CLASS 303

111 4,508,393

CLASS 307

66 4,508,974
261 4,508,975
270 4,508,976
468 4,508,977
482 4,508,978
513 4,508,979
530 4,508,980
542 4,508,981
572 4,508,982
577 4,508,983

CLASS 308

3.8 4,508,394
6 C 4,508,395

CLASS 310

14 4,508,984
55 4,508,985
67 R 4,508,986
68 C 4,508,987
154 4,508,988
184 4,508,989

CLASS 313

50 4,508,990
579 4,508,991

CLASS 315

5.39 4,508,992
59 4,508,993
200 R 4,508,994
209 R 4,508,995
224 4,508,996
360 4,508,997

CLASS 318

138 4,508,998
331 4,508,999
591 4,509,000
687 4,509,001
4,509,002
800 4,509,003
801 4,509,004

CLASS 320

68 4,509,005

CLASS 322

4 4,509,006

CLASS 324

60 C 4,509,007
73 R 4,509,008
95 4,509,009
158 D 4,509,012
158 P 4,509,010
161 4,509,013
305 4,509,014
309 4,509,011
4,509,015

CLASS 328

138 4,509,016

CLASS 329

105 4,509,017

CLASS 330

61 R 4,509,018
107 4,509,019
274 4,509,020
282 4,509,021
284 4,509,022

CLASS 331

176 4,509,023

CLASS 333

24 R 4,509,024

CLASS 335

85 4,509,025
4,509,026
201 4,509,027
202 4,508,028
208 4,509,029
216 4,509,030
306 4,509,031

CLASS 336

59 4,509,032
107 4,509,033

CLASS 338

34 4,509,034
35 4,509,035

CLASS 339

14 R 4,508,401
17 CF 4,508,399
4,508,402

17 LM 4,508,398
22 R 4,508,400
28 4,508,403
45 M 4,508,404
75 MP 4,508,405
89 M 4,508,406
4,508,408
89 R 4,508,407
97 R 4,508,409
99 R 4,508,410
4,508,411
126 R 4,508,412
129 4,508,413
143 R 4,508,414
4,508,415
176 L 4,508,417
176 M 4,508,416
253 R 4,508,418
256 S 4,508,419

CLASS 340

347 AD 4,509,036
4,509,037
347 DD 4,509,038
572 4,509,039
576 4,509,040
578 4,509,041
600 4,509,042
721 4,509,043
789 4,509,044
794 4,509,045
815.1 4,509,046
825.23 4,509,047

CLASS 343

5 CM 4,509,048
5 SM 4,509,050
7.5 4,509,049
17.2 PC 4,509,051
418 4,509,052
708 4,509,053
709 4,509,054
754 4,509,055
791 4,509,056

CLASS 346

1.1 4,509,057
4,509,058
4,509,059
76 PH 4,509,060
107 R 4,509,061
140 R 4,509,062
4,509,063
207 4,509,064
225 4,509,065

CLASS 350

3.6 4,508,420
3.71 4,508,421
6.8 4,508,422
96.23 4,508,423
174 4,508,424
335 4,508,427
337 4,508,428
350 S 4,508,429
351 4,508,430
354 4,508,431
357 4,508,432
454 4,508,433
4,508,434
529 4,508,435
614 4,508,426
641 4,508,425

CLASS 351

160 H 4,508,436

CLASS 354

78 4,508,437
105 4,508,438
154 4,508,439
187 4,508,440
217 4,508,441
400 4,508,442
402 4,508,443

CLASS 355

3 R 4,508,444
3 SH 4,508,445
14 R 4,508,446
14 SH 4,508,447

CLASS 356

5 4,508,448
30 4,508,449
237 4,508,450
315 4,508,451
375 4,508,452
394 4,508,453

CLASS 357

2 4,509,066
13 4,509,067
38 4,509,068
4,509,069
41 4,509,070

CLASS 358

11 4,509,071
17 4,509,072
86 4,509,073
106 4,509,075
4,509,076
111 4,509,074
139 4,509,077
160 4,509,078
165 4,509,079
166 4,509,080
225 4,509,081

CLASS 360

37.1 4,509,082
77 4,509,083
84 4,509,084
93 4,509,085
99 4,509,086
130.21 4,509,087

CLASS 361

29 4,509,088
79 4,509,101
92 4,509,102
100 4,509,089
119 4,509,090
154 4,509,091
172 4,509,092
4,509,093
314 4,509,094
321 4,509,103
386 4,509,095
4,509,096
395 4,509,097
398 4,509,098
413 4,509,099
433 4,509,100

CLASS 362

32 4,509,104
122 4,509,105
267 4,509,106
4,509,107

CLASS 363

45 4,509,108
126 4,509,109

CLASS 364

153 4,509,110
200 4,509,112
4,509,113
4,509,114
4,509,115
4,509,116
4,509,117
4,509,118
4,509,119
4,509,120
4,509,121
4,509,122
300 4,509,123
424.1 4,509,124
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187	4,508,864		CLASS 526	51	4,508,892	300	4,508,906		CLASS 560	442	4,508,925
283	4,508,865	190	4,508,880	85	4,508,893	345	4,508,907	204	4,508,917	766	4,508,926
401	4,508,866	201	4,508,881	89	4,508,894		CLASS 548	241	4,508,918	858	4,508,927
434	4,508,867	259	4,508,882	91	4,508,895	156	4,508,903		CLASS 562	916	4,508,928
607	4,508,868	262	4,508,883		CLASS 544	213	4,508,908	401	4,508,919	923	4,508,929
808	4,508,869	279	4,508,884	106	4,508,896	251	4,508,909	423	4,508,920		CLASS 585
	CLASS 525	318	4,508,885	127	4,508,897	367	4,508,910	443	4,508,921	377	4,508,930
64	4,508,870		CLASS 528	211	4,508,898	407	4,508,911		CLASS 564		CLASS 604
78	4,508,871	1	4,508,886	225	4,508,899		CLASS 549	20	B1 4,289,903	14	4,508,531
88	4,508,872	21	4,508,887		CLASS 546	253	4,508,912	407	4,508,922	22	4,508,532
91	4,508,873	23	4,508,888	99	4,508,900	320	4,508,913		CLASS 568	35	4,508,533
285	4,508,874	28	4,508,889	112	4,508,901	323	4,508,914	311	4,508,923	111	4,508,534
308	4,508,875	167	4,508,890	153	4,508,902		CLASS 556			282	4,508,535
310	4,508,876	191	4,508,891	196	4,508,904	418	4,508,915				
333.1	4,508,877										
333.8	4,508,878										

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	314	278,185	D8—	17	278,201	D11—	27	278,216			278,232		22 278,249		278,265
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	48	278,190		91	278,205			278,221		78	278,238		278,254	D23—	32 278,270
D6—	333	278,191	D9—	327	278,206			278,222		100	278,239		278,255		278,271
	373	278,195		339	278,207			278,223		107	278,240	D21—	104 278,256		122 278,272
	379	278,192		352	278,208		151	278,224		111	278,241		114 278,257	D24—	4 278,273
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